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16. ABSTRACT

This report describes the procedures and content for the environmental assessments that are required elements of facilities plans. It is directed not only to the consultants who most often develop these assessments, but to citizens and local officials who wish to become more knowledgeable about the issues to be covered in an environmental assessment.

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ENVIRONMENTAL ASSESSMENT

of

CONSTRUCTION GRANTS PROJECTS

January 1979

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INTRODUCTION

Purpose

This handbook is designed to aid grantees in the preparation of environmental assessments for wastewater treatment facilities. It will be particularly helpful to those grantees who are unfamiliar with the Construction Grants Program and the preparation of National Environmental Policy Act (NEPA) documents. Its intent is to identify the data that is required to evaluate and the procedures to be followed to analyze the environmental impacts associated with each alternative plan being considered for the treatment works.

In gathering data for an assessment, grantees are encouraged to consult with appropriate local, State and Federal agencies and organizations. This handbook identifies some good sources of information.

The handbook provides general guidance that is useful to all grantees. Some projects require a more sophisticated analysis than is described in this handbook. In such cases, references to literature or organizations that can further assist grantees are provided.

Background

Under the Federal Water Pollution Control Act Amendments of 1972, as amended by the Clean Water Act of 1977 (33 USC §§1251-1376), EPA will provide 75 percent of the eligible costs for the construction or improvement of conventional wastewater treatment works and 85 percent for systems utilizing innovative and alternative technology.

Grants are made in the following three stages:

Step 1 - Preparation of Facility Plan

Step 2 - Preparation of Detailed Design and Specifications

Step 3 - Construction of Treatment Works

A properly prepared facility plan ensures that the treatment works is constructed in an environmentally sound and cost-effective manner. To assist grantees in the preparation of such plans, EPA has issued Guidance for Preparing a Facility Plan, EPA/MCD-46, May 1975. This handbook supplements the guidance by elaborating on the requirements for the environmental assessment which is an integral aspect of the facility plan.

The environmental assessment is the part of the facility plan that examines and analyzes the environmental impacts of the alternative plans being considered for the treatment works. The assessment serves two purposes: it protects the environment by ensuring that all environmental impacts are taken into account in selecting a plan for the facility, and

it serves as a basis for deciding if an Environmental Impact Statement (EIS) is required.

If an EIS is required, the environmental assessment serves as a starting point. For some projects a joint EIS/Assessment (piggybacking) can be prepared. Where this piggybacking technique is used, grantees should also consult for additional guidance Program Requirements Memorandum (PRM) 75-31 - "Facilitating EIS Preparation with Joint EIS/Assessments." (PRMs are issued to clarify administrative and policy matters in the Construction Grants Program.)

NEPA

The National Environmental Policy Act of 1969 (NEPA)(42 USC §§4321-4361) was enacted to ensure that Federal agencies consider environmental factors in the decision-making process and utilize an interdisciplinary approach in analyzing those issues. Section 102(2)(C) of NEPA establishes additional procedural requirements for those activities that are deemed to be major Federal actions that "significantly affect the quality of the human environment." That section requires the preparation of an EIS. Appendix A describes EPA's implementation of NEPA.

Grantees prepare an environmental assessment of all environmental impacts for all construction grant projects even if the impacts do not appear to be significant. If EPA determines during its review of the project that impacts are minor or insignificant, then it does not prepare an EIS. It presents that decision in a document called a negative declaration which is supported by an environmental appraisal that summarizes the environmental assessment. (On October 29, 1978, the Council on Environmental Quality issued draft regulations on compliance with NEPA that would change the term "negative declaration" to "statement of no significant impact.")

Environmental Impacts

The environmental assessment must evaluate all impacts. Impacts include any change, whether beneficial or detrimental, that is caused, either directly or indirectly, by the construction of the wastewater treatment facility. Impacts are classified as "beneficial" or "adverse," and as "primary" or "secondary." Primary impacts are those directly associated with the construction and operation of the treatment works. For example, a temporary increase in a locality's noise level while a plant is under construction is an anticipated primary impact of every project. Secondary impacts are indirect effects of the project resulting from the growth or change in land use induced or facilitated by the construction of the plant or its associated sewers. For example, a project that includes the placing of sewers in a previously undeveloped area may encourage the construction of new housing which causes air and water pollution and places new demands on energy and water supplies. All of these effects are secondary impacts.

This handbook emphasizes the need to examine environmental impacts; however, intensive evaluations are not always required. For example, some wastewater treatment projects, such as new pump stations, have a limited potential for causing significant environmental impacts. If upon initial consideration, the project appears to produce only minimal impacts, the assessment's analysis can be greatly simplified. Complete documentation of the initial consideration is required.

Format of Handbook

The central item in this handbook is the checklist which precedes this introduction. This list denotes those types of environmental factors which grantees should consider when preparing an environmental assessment. Each factor is discussed in this handbook.

The handbook is divided into four chapters. Chapter I deals with the procedures to be used in identifying and analyzing environmental impacts. In particular, it describes the use of the overlay system as a method of organizing and analyzing the various environmental considerations. Chapter II describes in detail various natural and man-made features of the planning area that should be evaluated in an assessment. It includes sources of information about these features and identifies some common impacts associated with each. Chapters III and IV deal with special features that have unique characteristics or values that require more attention. Chapter III describes areas that are classified as hazardous or sensitive, and Chapter IV deals with pollution problems and the conservation of natural resources.

The discussion of each feature or factor included in Chapters II-IV is divided into five sections as follows:

Description: Includes definitions and background information and summarizes pertinent Federal laws that protect or regulate the feature or factor discussed.

Minimum Requirements: Outlines those procedures that must be undertaken for all projects and information that should be reviewed or included in the assessment.

Supplemental Requirements*: Describes those activities that must be undertaken if the initial investigation indicates that an adverse impact is likely to occur.

*The grantee is not required to undertake the activities described under supplemental requirements unless the initial investigation undertaken to comply with minimum requirements indicates that additional analysis is necessary.

Sources of Information: Includes lists of agencies or organizations that can provide data useful in evaluating impacts.

References: Lists Federal laws and regulations, EPA manuals and Program Requirements Memoranda (PRMs), and other publications that will be of assistance in completing the environmental assessment.

Format of Environmental Assessment

The format of the entire facility plan is discussed in detail in Guidance for Preparing a Facility Plan, EPA/MCD-46, May, 1975. When completing the environmental assessment portion of the facility plan, grantees should pay particular attention to the following requirements: data and maps collected on existing conditions in the planning area should be included in the section on Current Situation. In the section on Development and Evaluation of Alternatives, environmental impacts for each alternative should be presented along with the cost analysis. A separate section of the facility plan should summarize the environmental considerations.

Environmental assessments should be concise, factual and clearly written. Grantees may consult many information sources in becoming familiar with the environmental characteristics of the project area. However, not all of the data must be used in preparation of the assessment or included in the assessment document itself. Maps and charts can be used effectively to convey information in a succinct manner. Where data has been obtained from an outside source, the agency or organization that provided it should be indicated.

CHAPTER I PROCEDURES

1.0 Overview

The environmental assessment is one aspect of the analysis required to complete a facility plan. Although this handbook provides a separate set of procedures for doing an assessment, one should also keep in mind that these procedures must coordinate with the general procedures used in facility planning found in Guidance for Preparing a Facility Plan, EPA/MCD-46, May 1975. The following chart is set up to demonstrate the relationship between a facility plan and its environmental assessment:

Environmental Assessment Procedures	Corresponding Step in Facility Plan
1. Gather information on planning area	Step 1 - Effluent Limitations
2. Field trips to site 3. Assess current situation	Step 2 - Assess Current Situation
4. Determine impacts associated with each alternative 5. Consider mitigating measures	Steps 3 & 4 - Assess Future Situation and Develop Alternatives
6. Compare alternatives and select plan	Step 5 - Select Plan

1.1 Gather Information on Planning Area

The accuracy of the environmental assessment depends upon the care with which information is gathered on the planning area. This information is available from a variety of sources. For each impact discussed in this handbook, agencies and organizations which can provide useful information are listed. Some general sources are discussed below.

1.11 Library Retrieval System

Many libraries have computerized retrieval systems which can be utilized to uncover articles and studies on the planning area. Some systems are set up to scan not only the local collection but books and articles in libraries throughout the State and, in some cases, throughout the United States.

As an example, consider the system used by the Library of Congress and by other libraries. It allows searches to be done in four separate files by title, author or subject. One file scans books while the second contains an index of periodicals and pamphlets. The third file contains data on organizations qualified to provide information on a particular topic, and the fourth contains legislative information.

1.12 Maps

Maps are another helpful source of information on the planning area and can also be used to evaluate the impacts of proposed alternatives (see discussion of overlay system that follows). In addition, they provide a concise and accurate way to communicate information to EPA officials and local citizen groups interested in reviewing the project. This handbook recommends the use of maps in the final facility plan. (See Table 1.) Table 1 is a description of some special maps that may be available for the planning area.

Aerial Photos - Various types of aerial photos including black and white, color, infra-red, color infra-red and heat sensitive photos are available from the Department of Interior, Earth Resources Observation Systems Program (EROS), and the Department of Agriculture, Soil Conservation Service (SCS). In most cases, the use of black and white photos will be sufficient and the most economical. All photos should include overflight dates.

Aerial photos will disclose the physical features of the area including the differentiation of urban and rural centers. Additional interpretation by professional interpreters can provide additional data on land use including the location of wetlands, septic tanks and fault lines. For assistance in interpretation of these maps, contact EPA, Environmental Monitoring Support Lab, Las Vegas, Nevada.

U.S.G.S. Quadrangle - Quadrangle maps are uniform maps that have been done by the U.S. Geological Survey for all areas of the country. These maps usually show such features as topography, airports, urban areas, houses, woodlands, schools and open areas.

The U.S. Geological Survey presently operates the National Cartographic Information Center (NCIC) located in Reston, Virginia. This office can provide information on maps being prepared for an area by governmental agencies and some private organizations. Grantees should consult NCIC prior to developing their base and other maps.

Soil Maps - These maps show the types of soil found in the planning area. They can be used to help identify areas where the soil is suitable for septic tank use, land treatment, general construction or farming. Maps are available from SCS and have been completed for a large portion of the country. To effectively use these maps it is necessary to have supporting material available from SCS explaining their soil classification system and interpreting the maps.

TABLE 1

Required and Suggested Maps and Sources for Information
for Environmental Assessments

MAP TITLE	CONTENT	SOURCE
1. Vicinity Map*	Relationship of planning area to region.	Local or regional planning agency; transportation plan study; U.S. Geological Survey.
2. Aerial Photo**	Aerial view of planning area.	EROS; EPA; Local aerial photographic companies; previous local studies.
3. Physical Features or U.S. Quadrangle*	Topography, lakes, rivers, housing, industry, forests, highways, roads, drainage patterns and other physical features.	U.S. Geological Survey; U.S. Army Map Service; local planning agency.
4. Soil Map*	Soils; Soils suitable for septic tanks and land treatment; Soils capable of supporting structures; Prime and unique farmland.	Soil Conservation Service; State conservationist.
5. Map Showing Steep Slopes**	Slopes of 10 to 25 percent; Slopes over 25 percent.	U.S. Geological Survey; Soil Conservation Service.
6. Hydrologic Map*	Circulation & distribution of water on and below the ground; Aquifers and recharge areas; Water quality.	U.S. Geological Survey (water information group).

TABLE 1

Required and Suggested Maps and Sources for Information for Environmental Assessments

MAP TITLE	CONTENT	SOURCE
7. Floodplains**	100-year floodplains.	Flood Insurance Administration; U.S. Army Corps of Engineers; Soil Conservation Service.
8. Wild & Scenic Rivers**	Wild & Scenic Rivers designated or under study for designation.	Heritage Conservation & Recreation Service; Department of Agriculture.
9. Archeological & Historic Areas**	Archeological and historic sites.	State historic preservation officer; Local historical societies; State archeologist; National Park Service.
10. Wetlands**	Wetlands, marshlands, bogs.	Fish & Wildlife Service; Corps of Engineers.
11. Endangered Species Habitats**	Endangered species habitats; Wildlife breeding grounds.	Fish & Wildlife Service.
12. Hazards*	Slide areas; Areas subject to erosion; Seismic fault lines.	U.S. Geological Survey; State geological office.
13. Existing Land Use*	Existing land uses; Types of agricultural uses; Vacant land subject to land use controls.	Local planning agencies.
14. Comprehensive Land Use Plan*	Proposed land development plan.	Local planning agency.

TABLE 1

Required and Suggested Maps and Sources for Information
for Environmental Assessments

MAP TITLE	CONTENT	SOURCE
15. Census Tracts & Population	Census divisions; Census tracts; Enumeration districts; Population distribution.	U.S. Census Bureau.
16. Transportation Facilities	Arterial streets, highways, transit routes, railroads, airports, traffic flows.	Local traffic engineer; Local planning agency.

* Required
** Required if applicable

1.13 208 Planning in the Study Area

Many of the items investigated as part of the development of areawide water quality management 208 plans must also be addressed in doing an environmental assessment. Early consultation with the 208 agency responsible for the area which includes the study area is a sensible first step and can be very helpful.

If there is an approved 208 plan that includes the study area, the facility plan must conform with it. This includes consistency in such elements of the plan as population and housing projections, wetlands and floodplains identification, and the need and alternatives for wastewater treatment facilities in the study area.

1.14 Local and State Agencies

There are many local and State officials who are familiar with the various physical, social and economic features of the study area, and who have access to studies and reports that may be of help to the grantee. They can provide needed data and expert assistance in identifying and analyzing impacts. For each impact discussed in this handbook as one that should be considered in the environmental assessment, a section lists appropriate State and local sources for assistance. If these sources cannot help the grantee directly, they often can suggest other sources.

1.2 Field Trips

At least one field trip should be made for every project since a trip to the proposed site will reveal features not visible on graphic materials and will verify the accuracy of data abstracted from maps.

1.3 Assess Current Situation

This step involves using information gathered to formulate an accurate picture of present conditions in the planning area. This will be used to compare and evaluate alternatives. The checklist at the front of this handbook should be consulted frequently to ensure that all relevant factors have been investigated.

1.4 Determine the Impacts of Each Alternative

A basic part of the facility planning process is the complete consideration of all alternatives. The assessment should evaluate all alternatives that have been identified. The grantee should utilize the sections of the checklist at the front of this handbook labeled "primary" and "secondary" impacts to ensure that all possible environmental impacts for each alternative are being considered. Primary impacts are fairly easy to evaluate and usually will be similar from one project to the

next. Secondary impacts are much harder to isolate because they vary according to the individual characteristics of the planning area and in some cases require the use of sophisticated mathematical models to predict. Each alternative, including the no action alternative, should be considered separately.

To facilitate the evaluation of secondary impacts and to increase awareness of existing conditions in the planning area, this handbook encourages the use of an overlay system (Section 1.41). To determine secondary impacts and some primary impacts, knowledge of the location and extent of anticipated growth is required. For many projects this is difficult to do. The overlay system described in the next section is intended to assist grantees in selecting the undeveloped areas that are most likely to be subject to development. Guidance on estimating the magnitude of growth is given in Section 1.42.

1.41 Overlay Systems

There are a variety of overlay systems grantees may find useful to assist in the identification and evaluation of primary and secondary impacts. One system is described here. The system may not be appropriate for use by large urban areas or very small rural areas. These types of communities should consider using a modified version of the system or a system especially suited to their size and characteristics.

Overlay systems have the advantage of presenting a large amount of data in a simplified form. This allows grantees to consider simultaneously all the various types of impacts that are presented in this handbook. The systems require the preparation of a series of maps of the same scale. These maps are then transformed into clear overlays so that they can be looked at individually or in combination. Examples of those overlays are included at the back of this report. All of the data needed to complete the overlays should be available from the studies done in completing the environmental assessment.

The first step in the process is to prepare a base map. This map should show the boundaries of the planning area, major roads and railroads, rivers, lakes and other significant bodies of water. Other major parameters in the planning area not appropriate for the subsequent overlays might be added. It is worthwhile to keep the base map relatively simple for readability. Before preparing the base map, grantees should contact the NCIC operated by the U.S. Geological Survey to see if a base map that can be used is already available. Along with the base map it is helpful to prepare a map showing existing and proposed wastewater treatment works. These two maps can be made into separate clear overlays.

The next two maps categorize factors in the planning area on the basis of their potential for development. A map should be developed showing areas not subject to further development. The types of areas

included will depend upon the characteristics of the planning area. Some features that may be considered for inclusion are areas currently developed, where little or no new development is expected, and publicly-owned lands or areas where development is precluded by law. Some privately-owned undeveloped areas may also be included. For example, if a large amount of woodlands is currently owned by a paper company, and it is unlikely the company is going to sell any of this land, the woodlands should be included. This map will be made into a clear overlay. It shows areas where new development is least likely to occur because the ownership of land effectively precludes further development. It thereby focuses the assessment of secondary impacts on other areas.

Next, a map should be developed showing those characteristics inhibiting development. This overlay depicts constraints on development due to physical characteristics or the location of land. These characteristics inhibit or discourage but do not preclude development. The types of features that should be shown on this map depend upon an evaluation of the characteristics in the context of the community. For example, in some communities the presence of heavy industry will discourage residential development of the immediate surrounding area. In other areas this may not be true. Some possible candidates for inclusion are areas with excessive slopes, areas with soil conditions unsuitable for construction, and areas adjoining airports. Physical obstacles can be overcome with proper engineering and at extra cost. Economic pressures can result in the development of areas typically deemed undesirable because of their proximity to other uses. This overlay, when viewed with the previous one, should show areas where new development that might be served by the wastewater treatment plant is less likely to occur. It further defines the areas on which a secondary impact analysis should concentrate.

Another overlay should show areas with legal or institutional protection. These are areas which should be protected or enhanced. For example, by law a Federal action such as the funding of a wastewater treatment works cannot adversely affect the habitat of an endangered species. In some instances, special evaluation procedures are necessary before a Federal action can proceed. A treatment works can only be located in a floodplain if an assessment of alternative sites shows none are practicable. Areas that must be considered include historic and archeological sites, areas adjacent to wild and scenic rivers, prime and unique farmlands, wetlands and others. Federal actions, directly or secondarily, adversely impacting these areas are discouraged. The Federal action may or may not be prohibited. Where it is not, typically measures must be taken to mitigate adverse impacts. Table 2 gives examples of areas that might be represented on the overlays.

When these maps are completed, the grantee should be able to use them in conjunction with an overlay of the existing and proposed wastewater treatment works to evaluate the primary and secondary impacts associated with the project. They are not a substitute for comprehensive

TABLE 2

SUGGESTED FEATURES TO BE EVALUATED BY OVERLAY SYSTEMS

Areas unlikely to experience future development.

1. Fully developed areas
2. Privately-owned forests
3. Publicly-owned lands

Features that inhibit development.

1. Slopes unsuitable for development
2. Soil conditions unsuitable for construction
3. Land adjoining certain sites - airports, industrial areas, disposal sites, mines, quarries
4. Hazardous areas

Areas to be protected or enhanced by legal or institutional protection.

1. Sole source aquifers
2. Areas of particular scenic value
3. Prime and unique agricultural land
4. Wetlands
5. Endangered species and other significant wildlife habitats
6. Recreation sites
7. Cultural resources
8. Coastal zones
9. Floodplains
10. Wild and Scenic Rivers

land use plans. They can be used in conjunction with comprehensive land use plans or other area planning maps to determine if the wastewater treatment works will produce effects inconsistent with these other plans. Grantees will want to look at:

1. Whether the siting of the plant or sewers will occur on or in close proximity to environmentally sensitive areas.

2. Whether environmentally sensitive areas are likely to be developed.

3. Whether the project will impact areas protected by Federal, State or local law.

4. Whether the new system could induce scattered development or sprawl.

1.42 Additional Evaluation of Areas Subject to Growth

The evaluation of undeveloped areas using the overlay system will be sufficient for analyzing primary and secondary impacts for some projects. It will be evident what types of development are likely to occur. For example, in cases where an area is expected to maintain the character of a single family residential neighborhood, no further inquiry into whether development will be industrial or residential is required. Nor would it be necessary to do a detailed investigation of areas if there is a comprehensive land use plan which is being followed.

Other projects will require a more detailed investigation than the overlay system can provide. In this case, it is recommended the grantee use local land use plans, if available.

Grantees are expected to consider the environmental impacts of each alternative. It is usually difficult to determine that portion of future growth which would occur if the plant is not built. Past experience indicates, however, that the availability of sewers is one factor influencing growth. Therefore, grantees should assume that the construction of new treatment works will influence the location of future population growth; especially when the proposed project includes sewers or increases the amount of reserve capacity. When the distribution and amount of growth are identified, secondary impacts on air quality, water quality, traffic volume, lost land and added public services can be inferred.

1.5 Mitigating Measures

For each impact discussed in Chapters II through IV, specific mitigating measures are included where appropriate. The grantee should undertake all feasible procedures to lessen any impacts associated, either directly or indirectly, with the construction or operation of the treatment works.

The following is a list of possible mitigating measures:

Primary Impacts

1. Follow construction practices that reduce adverse impacts
2. Utilize operating procedures which restrict noise, odor, etc.
3. Carefully select and design the site.
4. Consider alternative rights of way for sewers.

Secondary Impacts

1. Reduce reserve capacity or size of service area.
2. Use alternative rights of way for sewers.
3. Improve land use planning and controls.
4. Phase sewer service.
5. Invoke sewer use restrictions.
6. Coordinate efforts with other environmental programs - areawide water quality management, air quality maintenance, State or local erosion controls.

1.6 Select Plan

This is the final stage of the facility planning process into which the environmental assessment is factored. Alternatives are compared upon the basis of cost, implementation capability and environmental impacts.

Grantees may find the use of a summary matrix helpful at this stage. Figure 1 shows one type of matrix that can be used. The impacts for each alternative are shown in terms of type of area affected and the nature and severity of the impact.

1.7 Public Participation

Both the National Environmental Policy Act (40 USC §§4321-4361) and the Clean Water Act call for active public participation in assessing environmental impacts and in planning wastewater treatment works. Under the Construction Grants Program, EPA, the States, and grantees are responsible for providing for, encouraging, and assisting the public to become informed about and involved in the development of facility plans. The objectives of public participation are to assure responsiveness of governmental agencies to public concerns and priorities and to improve public understanding of official programs and actions.

FIGURE 1

Environmental Impacts of Alternative Proposals

Environmental Impacts	Proposals		
	A	B	C
Water quality & supply			
Soil-prime & unique			
Floodplains			
Wetlands			
Endangered & Threatened Species			
Wild & Scenic Rivers			
Cultural Resources			
Coastal Zones			
Air Pollution			
Noise & Odor			
Energy			
Recreation Lands			

Legend

+	significant positive impact
±	minimal positive impact
0	no impact
−−	severe negative impact
−	minimal negative impact

Public hearings are required on all construction grants projects and are one form of participation which promotes a dialogue between the grantees and the public. Other effective methods include advisory committees, public meetings, workshops, questionnaires and distribution of fact sheets and documents prepared during the grant process. The environmental assessment as well as the facility plan should be widely distributed in draft and final form. To ensure informed public participation, these documents should be easily comprehensible to the general public.

General References

Guidance for Preparing a Facility Plan, EPA/MCD-46, May 1975

Handbook of Procedures, EPA/MCD-03, February 1976

PRM 75-26 - Consideration of Secondary Effects in the Construction Grants Process

Preparation of Environmental Impact Statements, 40 CFR* Part 6 (1978)

Mitigating Secondary Impacts from the Wastewater Facilities Program: An EPA Case Study Series, Office of EPA Land Use Coordination

Grants for Construction of Treatment Works, 40 CFR Part 35, Subpart E (1978)

Public Participation in Water Pollution Control, 40 CFR Part 25 (1979)

*CFR - Code of Federal Regulations

CHAPTER II NATURAL AND MAN-MADE FEATURES

2.0 Introduction

In evaluating the impacts associated with any alternative, it is necessary to examine a variety of features. This chapter identifies those features to be included in the environmental assessment which normally require only a minimum of investigation. More complex features (with special requirements) are discussed in Chapters III and IV. When analysis overlaps between a feature discussed in this chapter and one found in a later chapter, the in-depth treatment will appear in the later chapter.

Items investigated in this chapter will also be used to assist in analyzing the more complex impacts. For example, climate can affect air and water pollution problems.

2.1 Topography

Description

Topography is the study of the contours of the land and the location of significant physical and man-made features within a region. A topographical map can be used to identify those sections of the planning area unsuitable for development either because of excessive slopes or because of the deleterious effect new development will have on the area's drainage pattern.

Minimum Requirement

Obtain a topographical or U.S. Geological Survey Quadrangle map of the region. Note all areas where the slope is greater than 25 percent; these are areas where development will be difficult. Also, indicate the location of areas with slopes between 10 and 25 percent; although it is not as difficult in these areas, construction will still involve problems and should not be undertaken unless demand is great. Information should also be evaluated on the major and minor drainage basins and their characteristics, including area, slope, elevation, natural and artificial drainage nets, erosion and deposition. Development can adversely affect drainage patterns, contributing to flooding, soil erosion and poor water quality. If pertinent, data on drainage basins in the planning area can be included in the assessment.

Sources

Department of Army, Corps of Engineers

Department of Agriculture, Soil Conservation Service

Department of Interior, U.S. Geological Survey, National Cartographic Information Center

2.2 Geology

Description

Geology is the study of the formation and structure of the earth. For the purposes of an environmental assessment, knowledge of the geology of the planning area will aid in identifying areas whose soil composition is unsuitable for construction or where construction should be discouraged due to the proximity of aquifers or groundwater recharge areas. The natural features of an area can also contribute to the aesthetic quality of a region.

Minimum Requirement

Obtain a map of the geology of the planning area. There may be areas where development will be limited due to the inappropriateness of the site for construction. Indicate areas where development should be discouraged to protect groundwater supplies and to preserve the scenic value of unusual natural features. The map may also be of assistance in locating potential hazards such as earthquake zones and slide areas.

Sources

Department of Interior, U.S. Geological Survey, National Cartographic Information Center

State geological offices

2.3 Soils

Description

Knowledge of the characteristics of the soil found in an area is useful in evaluating erosion potential and the fitness of a particular portion of the area for a specific use such as farming or landfill. A soils map will also pinpoint areas with soils unsuitable for on-site disposal systems. Development in these areas may depend upon the availability of sewers or other alternative solutions.

Minimum Requirement

Become acquainted with soil types in the project area. This information can be obtained from a soil map available (with explanatory material) from the Soil Conservation Service. Particular attention should be given to characteristics such as depth of water table, permeability, erosion potential, expansion and compaction. This data will be used to locate areas that are unsuitable for subsurface soil absorption systems, other land disposal or treatment of effluents, landfills and sludge disposal. In some instances, it will also pinpoint areas with water quality problems.

Prime and unique farmland and other productive areas that also appear on soils maps are discussed in more detail in Chapter III.

Sources

Department of Agriculture, Soil Conservation Service

Local Soil Conservation Service officers

State conservationists

2.4 Climate

Description

Prevailing weather conditions influence the ecology of the planning area and can limit the feasibility of certain types of treatment systems. For example, runoff, flooding, and surface and groundwater water pollution are affected by the intensity of rainfall. Temperature and wind velocity can affect the severity of air pollution problems while the constant threat of hurricanes or tornados may discourage future development of an area.

Minimum Requirement

Review information about weather conditions in the planning area. Temperature ranges, monthly temperature averages, total annual precipitation, the degree of humidity, wind, and atmospheric stability can be valuable background data. Also, note any specific adverse weather conditions that are prevalent in the area.

Sources

National Weather Service

2.5 Population

Description

One of the most important factors in preparing an environmental assessment is the estimate of an area's current and future population. This data will be used to evaluate the magnitude of secondary impacts and to measure other impacts where information is available only on a per capita basis.

Care must be taken to ensure that forecasts are reliable and conform with other data developed for the environmental assessment. Projections will help in the estimation of future wasteloads and flows and are thus used in sizing and staging facilities. An inflated population projection can result in a project with excess reserve capacity and oversized sewers. Both of these can contribute to population growth with attendant

secondary impacts. They also contribute to the escalation of project costs which can place substantial financial burdens on communities.

Minimum Requirement

Obtain the latest population data from the Bureau of Census. To estimate current and to project future population for facility planning areas in standard metropolitan statistical areas (SMSA's), follow the projections of the Bureau of Economic Analysis, Department of Commerce, that incorporates the "Series E" projections of the Bureau of Census. Any departures must be justified. Non-SMSA areas must base projections on extensions of population growth trends since 1960 or 1965.

EPA has established a new procedure to go into effect in the near future. Grantees must comply with the requirements of the Cost-Effectiveness Analysis Guidelines, 40 CFR Part 35, Subpart E, Appendix A, published in the FEDERAL REGISTER on September 27, 1978. The guidelines set forth a disaggregation process for population projections that is designed to avoid provision of excess reserve capacity and oversizing of sewer lines. Projections used in facility plans must be based on disaggregations of State projection totals prepared by the Bureau of Economic Analysis. In consultation with regional planning agencies, the State divides its projection total among designated 208 areas, SMSA's not included in 208 areas, and counties or other appropriate jurisdictions not included in 208 areas or in SMSA's. The designated 208 planning agency subdivides its total. The State subdivides for other SMSA's. The State may subdivide the total for the remaining areas or leave it to facility planning grantees in those areas to produce consistent and justifiable forecasts. The guidelines allow some variation from State and 208 area totals if based on projections prepared by June 26, 1978. The State must submit its disaggregation to EPA by October 1, 1979. Six months after EPA approves the State disaggregation, facility plans must be based on the guidelines.

Along with population projections up to the year 2000, the Bureau of Economic Analysis has provided totals for each State which show total personal income, per capita income, and average earnings by occupation. The tables may be useful in analyzing other impacts discussed in this chapter. Grantees should consult with State or areawide (208) planning agencies about the Bureau of Economic Analysis projections. Projections should be consistent with those used for control of air quality, water resources management and other environmental programs, unless variations can be justified.

Sources

Department of Commerce, Bureau of Economic Analysis and
Bureau of Census

Water Division, EPA regional office

State water pollution agency

Local and areawide planning agencies

References

Population, Personal Income, and Earnings by State: Projections to 2000, Bureau of Economic Analysis (1977)

Cost-Effectiveness Analysis Guidelines, 40 CFR Part 35, Subpart E, Appendix A

2.6 Housing

Description

This section describes the data required to evaluate the present and future housing situation. As indicated below, many of the impacts associated with new housing are discussed in other chapters of this handbook.

Minimum Requirement

Review information on the type, density and location of housing within the planning area. Information on an area's average vacancy rate may also be useful. A vacancy rate represents the percentage of unused housing units and thus indicates the degree of current demand for new or additional housing and public services such as sewers.

The primary impacts upon housing are 1) the loss or gain of land available for building new homes, and 2) the displacement of existing residents whose homes are demolished.

Secondary impacts involve the changes in land use resulting from the provision of more treatment capacity and the installation of new sewers. The placement of sewers on previously undeveloped land will make these tracts more marketable for development. This is because sewage treatment is a service essential for extensive residential development.

The construction of new multiple and single family housing may result in the deterioration of the quality of the air and water, an increased demand for drinking water, energy and community services, and other impacts. All of these are discussed in other sections of this handbook.

Sources

U.S. Postal Service, Postal Surveys

Department of Commerce, Bureau of Ecomic Analysis

Department of Commerce, U.S. Census Bureau, Annual Housing Survey

Local planning agencies

Reference

Uniform Relocation Assistance and Real Property Aquisition Policies Act of 1970 (40 USC §§4601-4655)

Implementation of the Uniform Relocation Assistance and Real Property Aquisition Policies Act of 1970, 40 CFR Part 4

2.7 Industrial and Commercial Development

Description

The establishment of new industries in an area depends upon many factors often including the availability of sewers. Commercial development, on the other hand, tends to be directly associated with residential development.

Minimum Requirement

Information should be obtained on the area's commercial and industrial activities including location, number of employees and the land and natural resources requirements of the particular industry. If industrial and commercial development is significant in the planning area, estimates should be made of future economic development by using data on company relocations or expansions, census data on industries' future demand for employees, Bureau of Economic Analysis (BEA) projections on earnings by industry and bu industrial development rates. Otherwise, basic estimates of overall growth can be used.

The primary impacts upon industrial and commercial activities include: displacement of existing business and a decrease in land suitable for such use. In the environmental assessment, impacts associated with the project should be described as accurately as possible. Secondary impacts are discussed in later sections of this handbook.

Sources

Department of Commerce, Economic Development Administration, Overall economic development plans

Environmental Protection Agency, regional water division, BEA projections

Local and regional planning offices

2.8 Transportation

Description

A new sewage treatment plant can have some impact on transportation as it influences the location of population growth which, in turn, increases the demand for new or improved transportation systems. Transportation facilities are also of assistance in determining where growth is expected to occur. For example, industry is more likely to locate near railroads or major highways, while houses are generally built near transportation systems which can provide ready access to job centers.

Minimum Requirement

Indicate all major highways, railroads and airports in the planning area. Also, indicate any proposed new transportation facility that will be completed within the planning period.

Primary impacts include the increased traffic to and from the construction site. The effects of this increased traffic upon air quality and energy demands will be considered under these topics in later chapters.

Secondary impacts include air pollution, increased demand for fuel, traffic congestion and the possibility that new roads or other types of transportation will be needed to serve the increasing population. Many of these impacts are discussed in later chapters. If the area will experience a significant increase in population, determine if plans have been made to expand existing mass transportation or roads to accommodate this growth. One way to reduce secondary impacts is to ensure that growth will occur first in areas closest to existing population centers.

Sources

Department of Transportation, Federal Highway Administration and Urban Mass Transportation Administration

Local and regional State highway agencies

References

Secondary Impacts of Transportation and Wastewater Investments: Research Results, EPA 600/5-75-013, July, 1975

2.9 Economic and Social Profile

Description

The National Environmental Policy Act requires environmental assessments to address all impacts, not just those directly related to

pollution problems. The grantee must therefore give some attention to the possible impacts the new treatment works will have upon the financial and social characteristics of the planning area. Emphasis should be placed on the additional fiscal burden imposed by the new system, the demand for new community services and the changes in the composition of the population that will result from additional sewer construction.

Minimum Requirements

Collect data on housing, population, employment, local cost of construction of the new facility and user charges. Additional information, such as per capita income, racial or ethnic components, and age distribution can provide insight into a neighborhood's social characteristics. Using this data, determine what socioeconomic impacts the project is likely to have. The following is a list of some economic and social changes that may be associated with the construction of a wastewater treatment facility and the placement of new sewers:

1. Financial strain on the local community required to provide the local share of the capital cost of the new facility.

2. Additional charges or taxes on residents needed to provide for the operation and maintenance of the system.

3. Increased taxes and public spending needed to provide additional community services required by new residents and industries (community services include police and fire protection, hospitals, schools, garbage collection and public transportation).

4. Fluctuations in land values. Areas in close proximity to the plant or disposal sites are likely to decrease in value while areas where sewage collection is now available are likely to appreciate in value.

5. Increase in revenues available to the community from new residents, new industries or higher per capita incomes.

6. Changes in the characteristics of the population due to increased taxes, rising property values or the elimination of low income housing.

7. Unfair distribution of benefits and burdens in the area where the project actually benefits only one segment of the population.

Sources

Local or regional planning agencies

Local housing agency

References

PRM 76-3 - Presentation of Local Government Costs of Wastewater Treatment Works in Facility Plans

PRM 75-32 - Compliance with Title VI in the Construction Grants Program

Nondiscrimination in Programs Receiving Federal Assistance from EPA - Effectuation of Title VI of the Civil Rights Act of 1964, 40 CFR Part 7 (1977)

2.10 Undeveloped and Vacant Land

Description

Undeveloped land and vacant land include land having an average density of less than 1.7 persons per acre. The construction of wastewater treatment works could result in the development of these areas to a degree or a rate greater than would have previously been anticipated.

Minimum Requirement

Evaluate the undeveloped areas in terms of location, size, physical characteristics, location of interceptors, fitness of land for construction and on-site systems, and land values. These are all factors that will determine which areas are most likely to be developed to accommodate expected growth.

2.11 Land Use Controls

Description

Various items can be included under the general category of land use controls. Land use controls can be legal restraints on the use of land such as zoning, building height limits or density regulations. A comprehensive plan is another example although it is not usually legally binding.

Minimum Requirement

Identify all major land use controls. For each one, evaluate whether the projected growth associated with each alternative will conform with the requirements of the control. Note ways in which the new facility could defeat the purpose of existing land use controls.

Sources

Local and regional planning agencies

Local zoning and building inspectors

2.12 Other Projects and Programs

Description

Other projects and programs may affect the degree and location of future growth. These projects and programs, in combination with waste treatment facility construction, may produce impacts that are more severe than those anticipated by studying each project individually. For these reasons, it is important to look at other projects planned or already being built in the planning area.

Minimum Requirement

Consider other major ongoing or planned Federal, State, regional or local projects or programs which will or may have social, environmental or economic impacts on the planning area. Determine if these projects will have any effect on the proposed alternatives. In particular, note how these projects will influence growth projections and locations. For example, will the new housing project be built on the east side instead of the west side because a new highway is being built to the eastern side of town?

Sources

Local and regional planning agencies

Local economic development agency or organization

References

Local capital improvement programs

Local and regional plans

CHAPTER III SENSITIVE AND HAZARDOUS AREAS

3.0 Introduction

This chapter is devoted to a discussion of areas which require special protection for various economic and environmental reasons. In many cases these areas are protected by Federal and State legislation. This chapter is not intended to be an all-inclusive exploration of impacts associated with hazardous and sensitive areas. Some hazardous areas, such as earthquake zones and areas with adverse weather conditions are discussed in Chapter II. Some areas fall under more than one subsection of this chapter. For example, a wetland could also be in a floodplain, a coastal zone, an endangered species habitat or a park. Areas must satisfy all the separate requirements discussed in each relevant section of the chapter.

3.1 Floodplains

Description

Floodplains are relatively flat areas or lowlands adjoining the channel of a river, stream or water course which have been or may be covered by floodwater. A flood is a "general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland and/or tidal waters and/or the unusual and rapid accumulation or runoff of surface water from any source." (Executive Order 11988, Floodplain Management, May 25, 1977) A reference to a floodplain should be accompanied by a modifier indicating the level of flooding, e.g., 100 year floodplain (one percent chance of flooding in any year).

The benefits of preserving floodplains in their natural or relatively undisturbed state include the reduction of flood hazards and losses, maintenance of water quality standards, replenishment of groundwater, soil conservation, the fostering of fish, wildlife and plant resources and provision of recreational areas. The National Flood Insurance Act of 1968, as amended by the Flood Disaster Protection Act of 1973, provides government sponsored flood insurance for structures in flood prone areas if the community involved undertakes floodplain management measures to limit development in these areas.

Minimum Requirement

All grantees must identify any 100 year floodplains found within the planning area. If the area is predominately privately owned, consult the Federal Insurance Administration of the Department of Housing and Urban Development. That agency prepares two types of maps that will be useful in identifying floodplains. One type shows the boundaries and elevations of the 100 year and 500 year floodplains and is known as a Flood Insurance Rate Map (FIRM). A detailed report known as a Flood

Insurance Study Report may also be available for the planning area to supplement the information shown on the map. The other type of map is less detailed and known as a Flood Hazard Boundary Map (FHBM). (Figure 2) This map shows the approximate area of the 100 year zone. If neither map is available or if more detailed information than that shown on the maps is required, consult the agencies listed under Sources for assistance. If these sources can not provide information, consult an engineer experienced in identifying these areas.

For areas predominately State or Federally owned, consult initially with the controlling agency. If no information is available, contact the agencies listed below.

Once all areas have been identified, determine if any of the alternatives will have an impact upon any 100 year floodplains. If the construction site is within a 100 year floodplain or growth is projected for these areas, the detailed analysis described in the next section is required.

Supplemental Requirement

Executive Order 11988, 42 FEDERAL REGISTER 26,951 (1977), requires that a "closer look" be taken at Federal projects in order to avoid adverse impacts associated with actual construction in or development of floodplains. This order emphasizes the importance of the evaluation and mitigation of impacts as well as early public review of plans involving action in a floodplain.

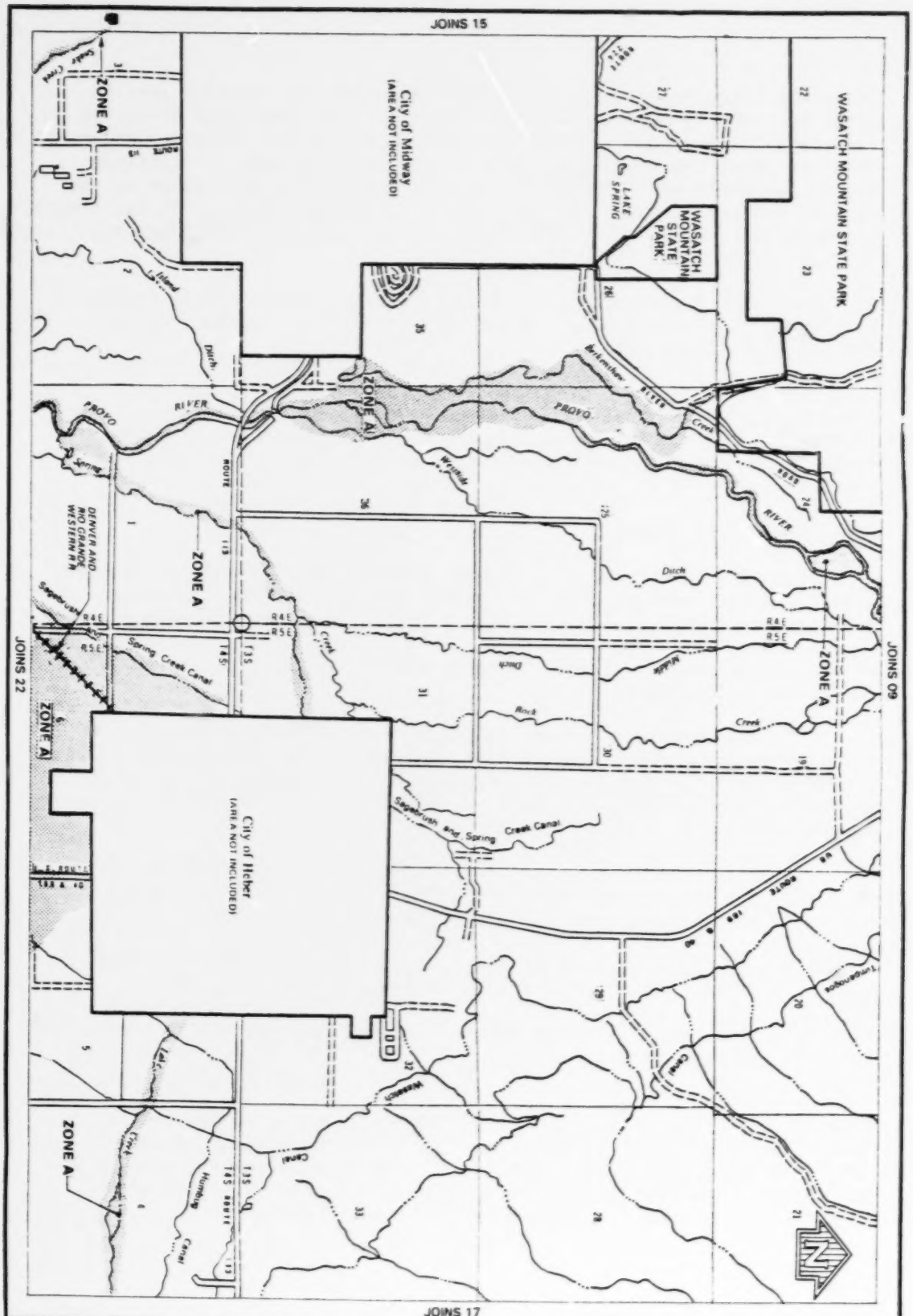
If a determination is made that one or more of the alternatives will involve floodplain construction, the project may not proceed unless a determination is made that no practicable* alternative exists to the proposed plan and that all possible mitigating measures will be implemented. Thus, it is required that:

1. All possible alternatives be considered, including the no action alternative, alternative sites for the project and alternative means of accomplishing the objectives.

2. All impacts be evaluated, including flood hazards and the effects on the natural and beneficial floodplain values.

3. Measures to minimize impacts and restore or preserve floodplains be considered.

*Practicable - "capable of being done within existing constraints. The test of what is practicable depends upon the situation and includes consideration of the pertinent factors, such as environment, cost or technology." (Water Resources Council Guidelines for Implementing Executive Order 11988, 43 FEDERAL REGISTER 6030, 1978)



16	DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT Federal Insurance Administration **WASATCH CO., UT** (UNINC. AREA)	APPROXIMATE SCALE 2000 0 2000 4000 6000 FEET FIG. 2 **FLOOD HAZARD BOUNDARY MAP**	EFFECTIVE DATE 5/31/77

The following are possible methods for reducing floodplain impacts for construction grants projects. The list is only illustrative and is not intended to indicate these are the only methods available.

1. Use minimum grading requirements.

2. Return site to natural contours.

3. Maintain floodplain vegetation to reduce sedimentation.

4. Regulate methods used for grading, filling, soil removal and replacement to reduce sedimentation during construction.

5. Dispose of waste materials so as not to contaminate ground or surface water or change land contours.

6. Require topsoil protection programs during construction.

In deciding whether to locate in a floodplain, public comments and opinions should be considered. In the Construction Grants Program, this means that discussion of the issue should take place at any public hearing held on the project, and that the following topics should be addressed in the environmental assessment, A-95 notice* or any draft material put out before the public hearing:

1. Why the project must be located in a floodplain;

2. All significant facts considered in making the determination;

3. Whether the actions conform to applicable State or local floodplain protection standards;

4. How the project will be designed or modified to minimize harm to or within floodplains;

5. How the action affects natural or beneficial floodplain values.

The environmental assessment should also include a summary of actions taken to elicit public comments and to consult with other agencies, groups and individuals consulted on the project.

Grantees are required to take into account secondary effects on floodplains. As has been mentioned, this involves considering all alternatives, evaluating impacts and undertaking mitigating measures. An example of a possible mitigating measure would be to limit sewer hook ups in the floodplain.

*Before a facility plan is approved, it is reviewed by interested parties at the local level pursuant to the Office of Management and Budget's Circular A-95, "Federal and Federally Assisted Program and Projects," 38 FEDERAL REGISTER 32,874 (1973).

Sources

Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Program

Department of Agriculture, Soil Conservation Service

Department of Army, Corps of Engineers

Department of Commerce, National Weather Service

Department of Interior, Geological Survey

Department of Interior, Bureau of Land Management

Department of Interior, Fish and Wildlife Service

Area river basin commissions

References

Flood Disaster Protection Act of 1973; National Flood Insurance Act of 1968, 42 USC §§4001-4128

Floodplain Management, Executive Order 11988, 42 FEDERAL REGISTER 26,951 (1977)

Water Resources Council Guidelines for Implementing Executive Order 11988, 43 FEDERAL REGISTER 6030 (1978)

National Flood Insurance Program, 24 CFR Part 1909 (1977)

Statement of Procedures: Floodplains and Wetlands, United States Environmental Protection Agency

PRM 76-5, Flood Insurance Requirements

3.2 Wetlands

Description

Wetlands are land areas which, because of their frequent inundation by surface or groundwater, can support vegetative or aquatic life that requires saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats and natural ponds. Executive Order 11990, Protection of Wetlands, 42 FEDERAL REGISTER 26,961 (1977). Wetlands provide habitats for plants and animals that are critical parts of food chains in coastline ecosystems. Commercially important marine life as well as threatened and endangered species depend on wetlands. In addition they may be a natural wastewater treatment system, a future energy and water supply, a means to prevent shoreline erosion, a buffer zone between salt and fresh water, a recreational area and in some cases, a natural recharge area.

Minimum Requirement

Determine if there are any wetlands in the planning area. Currently, maps are available for some areas from the Fish and Wildlife Service, Department of Interior, or from local or State planning agencies. Over the next few years, maps will be prepared by the Fish and Wildlife Service for the balance of the country. If there are no wetlands, the evaluation is complete. If wetlands exist, determine if there will be actual construction in these areas or if future growth is projected in or near these areas. Secondary impacts are most likely to occur if sewers are located in wetlands or within 1,000 feet of them.

If any major part of the treatment works will be located in wetlands or will have a significantly adverse primary or secondary impact on wetlands, the evaluation described in the next section must be undertaken.

Supplemental Requirement

The grantee must determine each alternative's impact upon the wetlands. This evaluation includes looking at alternatives, analyzing their comparative impacts as well as considering measures to mitigate harm and restore and preserve the wetlands. Any impact that affects the wetland's natural or beneficial value must be considered. Factors considered include the public health, safety and welfare; the maintenance of natural systems; and any use that is in the public interest.

Primary impacts occur as a result of construction or operation activities in, in close proximity to, or upstream of wetlands and which cause the destruction or alteration of these areas. Describe in detail the acreage, characteristics and location of any wetlands which are likely to be substantially changed or destroyed. Identify any temporary impacts the construction activities are likely to cause. Include a description of mitigating measures, such as restoration, which are to be used to minimize the project's impacts. Pay special attention to the effects upon the quality of surface and groundwater adjacent to the wetland areas. Executive Order 11990 forbids construction in a wetland unless no practicable alternative exists. If construction occurs, the Executive Order requires that all possible steps to minimize harm be taken. Under the regulations for the Construction Grants Program, interceptors can be extended into environmentally sensitive areas such as wetlands only if necessary to eliminate existing point discharges and to accommodate wastewater flows from existing habitations that violate an enforceable requirement of the Clean Water Act. Collection systems funded through construction grants should not provide capacity for new habitations or establishments located in wetlands. The environmental assessment should address these requirements.

Investigate State and local laws dealing with wetlands. Discuss any difficulties or special requirements these laws may create.

Grantees who are considering siting a wastewater treatment plant or sewers in a wetland should also be aware of the existing Federal laws that regulate these activities. Under §10 of the Rivers and Harbors Act of 1899 and §404 of the Federal Water Pollution Control Act, dredge and fill activities cannot be undertaken in wetlands without a permit issued by the Corps of Engineers. In addition, the Administrator of EPA can prohibit any filling of wetlands if he or she determines such activities will have an unacceptable adverse impact on municipal water supply, shellfish beds, fisheries, wildlife or recreational areas.

Evaluate secondary impacts which will occur if the area is developed in response to increased demand for housing or industrial sites. For each alternative, determine how many acres of wetlands are likely to be developed in order to satisfy the future demand for houses and industrial structures. Also, indicate how many acres in the surrounding area will experience growth during the planning period. This collateral development can also affect the natural values of the wetlands, particularly if it is upstream. Possible mitigating measures to consider include sewer hook up restrictions, restoration of previously destroyed wetlands, construction techniques that protect wetlands, and establishment of a wetlands protection zone.

Sources

Department of Army, Corps of Engineers

Department of Agriculture, Soil Conservation Service

Department of Interior, Fish and Wildlife Service

EPA, Branch for review of §10 permits

References

§10, Rivers and Harbors Act of 1899, 33 USC §§401-466n

§404, Federal Water Pollution Control Act, 33 USC §§1251-1376

Protection of Wetlands, Executive Order 11990, 42 FEDERAL REGISTER 16,961 (1977)

Permits for Activities in Navigable Waters or Ocean Waters, 33 CFR §209.120 (1976)

Statement of Procedures, Floodplains and Wetlands, United States Environmental Protection Agency

3.3 Wild and Scenic Rivers

Description

The Wild and Scenic Rivers Act protects, in their "free flowing" condition, designated rivers or river segments with exceptional natural, scenic, recreational or other qualities worthy of preservation. River segments may be categorized as either wild, scenic or recreational and each category is accorded a different level of protection. The Act is administered jointly by the Departments of Agriculture and Interior. A river is added to the system by Federal legislation or by State legislation with the approval of the Secretary of the Interior.

Minimum Requirement

Determine if there are any designated or officially recognized wild, scenic or recreational rivers in the planning area or if any such rivers are under study for inclusion in the system. If none, the analysis is complete. If the planning area contains either a designated river or one under study, determine for each alternative 1) whether construction is planned near the river, 2) whether growth is projected for areas contiguous to or upstream from the designated segment or 3) whether the river is to be used for disposal of effluent. If any of the above conditions are present, proceed with the evaluation discussed in the next section.

Supplemental Requirement

The Wild and Scenic Rivers Act prohibits the approval of any Federal grant which would have a direct adverse effect on those characteristics which caused the river to be classified as wild, scenic or recreational. Contact the agency responsible for administering the river segment involved for information and assistance in evaluating impacts. Often a development or control plan for all or part of the area will have been prepared. Evaluate the primary impacts. In particular, note the impacts upon the scenic or recreational qualities of these rivers as well as possible mitigating measures (such as landscaping in order to camouflage buildings). If any alternative plan under consideration will result in conditions inconsistent with the character of the designated segment, eliminate it as unacceptable. Note that the classification of the particular river has a bearing on what is considered an acceptable impact. For example, any alteration of a wild river is unacceptable although some impacts upon recreational rivers are permitted.

Although secondary impacts are not addressed by the Wild and Scenic Rivers Act, NEPA regulations require that they be discussed. In considering such secondary impacts, determine if the construction of the sewer plant will encourage development of land adjacent to or upstream from these segments and discuss how this development will affect the river. Actions such as hook up restrictions should be considered to limit growth.

Rivers are often legal boundaries and so development may be subject to intergovernmental plans or arrangements. Reference should be made to such conditions if they exist.

Sources

Department of Interior, Heritage Conservation and Recreation Service and National Park Service (for rivers not in National Forests)

Department of Agriculture, Forest Service (for rivers in National Forests)

State Water Quality Control Board

References

Wild and Scenic Rivers Act of 1968, 16 USC §§1271-87 (1970) amended 1974

3.4 Cultural Resources

Description

Cultural resources include districts, sites, buildings, structures or objects which are significant in American history, architecture, archeology or culture. Because of their cultural significance, these structures and sites are protected by a number of Federal laws. In facility planning, protective actions revolve generally around properties on or eligible for inclusion on the National Register of Historic Places, which includes both archeological and historic sites.

Minimum Requirement

Consult the State Historic Preservation Officer (SHPO) to determine if there are any properties in the planning area which are included or are eligible for inclusion in the National Register of Historic Places. If there are none, the analysis is complete. If there is insufficient information available to determine if the proposed construction site contains cultural resources, a field survey may be required. The scope of the required survey will depend upon the probability that sensitive material will be found. For most projects, a documentary search of reference materials or a walkover reconnaissance survey will suffice. In some cases, where numerous archeological sites are present, more extensive surveys, including excavation activities, will be required.

Contact the EPA regional office for authority to conduct this survey. If property located in the planning area is included or eligible for inclusion in the National Register of Historic Places, further consultation with the SHPO is required as described in the next subsection.

Supplemental Requirement

Information on all alternative sites being considered for sewers and plants should be furnished to the State Historic Preservation Officer (SHPO). If EPA in consultation with the SHPO determines that any alternative will have an impact on a protected property, the SHPO, the grantee and EPA will work together to develop methods for mitigating the anticipated impact. The SHPO's recommendations and findings on impacts should be included in the environmental assessment. Possible mitigating measures include: excavation of archeological material, relocation of sewer lines, and restrictions on development near historic sites. If EPA determines that the proposed project will have an adverse effect on property on or eligible for inclusion on the National Register, then the Advisory Council on Historic Preservation (ACHP) has the right to comment on the undertaking. The ACHP may also comment if it disagrees with a determination by EPA that no adverse effect will occur. All parties will attempt to formulate a memorandum of agreement on measures to be taken to mitigate or minimize impacts on protected cultural properties. If this cannot be done, then the full ACHP directing body can review and comment on the proposed project. As this handbook was being finalized, the ACHP proposed revisions to its regulations. The revised requirements will apply to projects begun after the regulations are promulgated, which should be early in 1979.

Sources

Department of Interior, Heritage Conservation and Recreation Service, Interagency Archeological Services and National Register Office

Department of Interior, National Park Service

Advisory Council on Historic Preservation

State Historic Preservation Officer

State Archeologist

Local historical society

References

National Historic Preservation Act of 1966, 16 USC §§470-470+

Historical and Archeological Data Preservation Act 16 USC §§469-469h

Historic Sites, Buildings and Antiquities Act of 1935, 16 USC §§461-467

Antiquities Act of 1906, 16 USC §§431-433

National Register of Historic Places, (the list is published regularly in the FEDERAL REGISTER)

PRM 75-27, Field Survey to Identify Cultural Resources

Procedures for the Protection of Historic and Cultural Property, 36 CFR Part 800 (1977)

3.5 Endangered Species, Fish and Wildlife

Description

The Endangered Species Act of 1973 provides for the protection and conservation of threatened or endangered plants and wildlife. The Secretary of Interior is responsible for designating threatened or endangered species, except for species of marine life which are under the jurisdiction of the Secretary of Commerce. Section 7 of the Act forbids Federal funding of activities which will result in the modification or destruction of critical habitats.

Minimum Requirement

Identify generally the plant and animal life found in the planning area. Special attention should be given to endangered or threatened species. If such data is not available, contact the EPA regional office to determine if a field survey is necessary. If endangered species are present in the planning area, the more detailed evaluation outlined in the next section should be undertaken. Project impacts on plants and animals not designated as threatened or endangered should be analyzed generally. If there will be a serious impact on fish and wildlife resources, consultation with agencies established to protect them will be necessary.

Supplemental Requirement

The grantee must collect biological data on the threatened or endangered species found in the project area, including information on the species' food, cover and mating habits and other requirements necessary for its continued survival. A helpful source for such information is the computer information system for environmentally sensitive wildlife ("SPECINFO"), operated by the U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. The State in which the project area is located may also have an endangered species program that can provide information. If a determination is made that the project will have an impact upon a threatened or endangered species, the grantee must request consultation with the regional office of the Fish and Wildlife Service (FWS), Department of Interior. The FWS will study the project, request additional information or surveys and then issue a final opinion as to whether the project will jeopardize an endangered or threatened species or a critical habitat. Controversial projects may be reviewed by a Federal interagency panel.

If there is a serious impact on other fish and wildlife resources, the FWS, counterpart State agencies and the National Marine Fisheries Service (for marine species) must be consulted. As this manual was being prepared, the FWS was drafting new regulations. They will apply to projects begun after their promulgation.

Mitigation measures, such as the relocation of the project, must be undertaken if a threatened or endangered species will be jeopardized. The Fish and Wildlife Service's opinion and recommendations should be included in the environmental assessment.

Sources

State and local conservation agencies and organizations

Department of Interior, U.S. Fish and Wildlife Service

Other Federal and State agencies responsible for fish and wildlife

FEDERAL REGISTER (list of threatened or endangered species)

References

Endangered Species Act of 1973, as amended, 16 USC §§1531-1543 (Supplement V, 1975)

Endangered and Threatened Wildlife and Plants, 50 CFR Part 17 (1977)

Fish and Wildlife Coordination Act of 1958, 16 USC §§661-666c (Supplement V, 1975)

Interagency Cooperation - Endangered Species Act of 1973, 50 CFR Part 402 (1978)

Marine Mammal Protection Act of 1972, 16 USC §§1361-1407 (Supplement V, 1975)

3.6 Coastal Zones

Description

The Coastal Zone Management Act of 1972 provides funds for States to formulate plans to preserve, protect, develop and improve their coastal resources. These plans attempt to prevent shoreline erosion and the loss of living marine resources and wildlife, preserve nutrient rich areas and recreational areas, and avoid adverse changes to ecological systems.

Minimum Requirement

If the project is in one of the coastal States covered by the Act, determine if a coastal zone management plan has been approved by the Secretary of Commerce. If there is an approved plan, determine if the project will affect the coastal zone. In evaluating impacts caused by the project, consider whether changes in land use, or changes in the

quality of coastal zone resources will occur. Also consider whether the range of uses of resources will be limited. The supplemental requirements apply if the project will have an effect on coastal resources.

Supplemental Requirement

Under the Coastal Zone Management Act, projects receiving Federal assistance must be consistent with approved State plans. Review of the project by the State coastal zone agency is accomplished through the existing A-95 review process. The State agency has 45 days in which to notify grantees and EPA of any objections to the proposed project. If an objection is made, the State agency will indicate the manner in which the project is inconsistent with specific elements of the management program and what steps can be taken to meet the requirements of the State plan. Grantees may choose to accept suggestions of the State coastal zone management agency and revise the project. If there is serious disagreement, grantees may request mediation by the Secretary of Commerce. The Secretary of Commerce may waive the consistency requirement if the project achieves other important national objectives, there are no reasonable alternatives, and it is in the public interest to do so.

Sources

Department of Commerce, Office of Coastal Zone Management

State coastal zone management agency

References

Coastal Zone Management Act of 1972

Federal Consistency with Approved Coastal Management Programs, 15 CFR Part 930 (43 FEDERAL REGISTER 10510)(1978)

3.7 Recreation Open Space

Description

Public demand for recreational open space rises as leisure time increases. The construction of wastewater treatment facilities can directly eliminate recreation open space. Development associated with new wastewater treatment service can also eliminate or modify recreation open spaces. To the contrary, facilities can be planned to take advantage of recreational open space opportunities.

Many open space areas are sensitive areas that should be analyzed both from the ecological and recreational perspectives.

Minimum Requirement

Locate all recreational open space in the planning area. Determine the acreage, facilities and uses associated with each area. Try to avoid adverse impacts if practicable. Otherwise, consider mitigation measures such as establishing new parks and designing facilities to protect the aesthetic value of the surrounding area.

Facility plans initiated after September 30, 1978, must analyze recreation and open space opportunities associated with the wastewater treatment works. Study the feasibility of combining treatment works with parks, bicycle paths, hiking trails and other recreational uses. If applicable, consider ways to maintain recreational access to waterways.

Sources

State recreation agency

Local or regional planning agencies

Local parks or recreation agency

National Recreation and Park Association or State chapter

Department of Interior, Heritage Conservation and Recreation Service, regional office

References

State Comprehensive Outdoor Recreation Plan

PRM 77-4, Cost Allocations for Multiple-Purpose Projects

Opportunities in Water Cleanup and the Land (EPA 1978)

3.8 Agricultural and Productive Lands

Description

The continuing decrease in acreage devoted to agricultural uses has had serious adverse social, economic and environmental impacts in some sections of the country. Special attention should be given to those areas with unusual values, such as "prime and unique farmlands" or areas with special social or economic value to a State or local area. Prime farmland is land which has the best physical and chemical characteristics for producing food, feed, forage, fiber and oil seed crops. In general, these lands have an adequate and dependable moisture supply, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content and few or no rocks. The soil is permeable to air and water and not excessively erodible or prone to floods.

Unique farmland is used for the production of specific, high value food and fiber crops. Its soil quality, growing season, temperature, moisture, air, drainage, humidity, elevation and other conditions favor growth of a specific food or fiber crop. Areas with special State or local value are those which are important because of the characteristics of the area. For example, the last remaining dairy farm left in the area would have special local value.

Minimum Requirement

Identify all land in the planning area used or suitable for use as farms, forests, orchards or nurseries. In particular, consider the amount and location of prime and unique farmlands.

Primary impacts may be minimal unless the plant or sewers will be located in or near the identified areas. If construction is planned for those areas, evaluate the effect it will have on normal farm activities.

Determine how many of these areas will be subject to development. If the areas surrounding prime and unique farmlands are likely to be developed, this could have negative impacts upon these highly productive areas. Evaluate the impacts accompanying the loss of these lands to other uses. If prime or unique agricultural lands or areas with special value to the local or regional area will be affected by negative impacts, additional analysis should be performed to identify the options which have the least adverse impact.

Supplemental Requirement

In evaluating impacts causing a loss of productive land, remember that the effects can be social and economic as well as environmental. The presence of farmland in an area can improve the air and water quality and with good management can prevent erosion. Farmlands may serve as a disposal site for recycled sludge and effluent and are compatible adjacent uses for wetlands and floodplains. The destruction of these areas may also result in an area being forced to obtain farm goods from distant points, thus increasing costs and use of energy as well as decreasing the area's self-sufficiency. However, farmlands are often the sources of nonpoint source pollution such as feedlot runoff or fertilizer runoff; the effects of eliminating these pollutants should also be discussed.

Prime and unique farmlands cannot be restored once they are developed. Grantees should consider mitigating impacts or rejecting alternatives which have a significant impact on those areas. Possible mitigating measures include the use of zoning and other land use controls to prevent development of these areas and provision of financial assistance or incentives to farmers to discourage sales to developers.

EPA policy and regulations disallow the placement of interceptors in prime agricultural lands unless it is necessary to eliminate existing point source discharges and to accommodate flows from existing habitations

that violate an enforceable requirement of the Clean Water Act. Collection systems may not provide capacity for new habitations or other establishments located in prime agricultural lands.

Sources

U.S. Department of Agriculture, Soil Conservation Service county agents or Soil Conservation Service agents detailed to EPA regional offices

U.S. Department of Agriculture, State Land Use Committees

References

Prime and Unique Farmlands, 43 FEDERAL REGISTER 4030 (1978) (to be codified as 7 CFR Part 657)

EPA Policy to Protect and Preserve Environmentally Significant Agricultural Lands, September 1978

CHAPTER IV POLLUTION AND CONSERVATION OF NATURAL RESOURCES

4.0 Introduction

This chapter discusses the ways in which a new wastewater treatment works can have an impact upon pollution or conservation problems. In constructing a wastewater treatment works, the correction of a water pollution problem should not create or exacerbate other pollution problems.

4.1 Air Quality

Description

The Clean Air Act Amendments establish a procedure by which States are responsible for planning and enforcing air pollution controls with the assistance of EPA. EPA is required to establish primary and secondary national ambient air quality standards for pollutants. These standards relate to the maximum level of pollutants allowable in order to protect the public health or welfare. At present, standards have been set for six pollutants--nitrogen oxides, carbon monoxide, sulfur oxides, hydrocarbons, particulates, and photochemical oxidants.

Each State is required to attain and maintain the air quality within its boundaries so that the national ambient air quality standards are not violated. A State submits an Implementation Plan, known as a SIP, for EPA approval, outlining the steps proposed to be taken to fulfill its obligations under the Clean Air Act. Methods can include the control of new or existing sources emitting pollutants or a comprehensive transportation control plan. The SIP will also identify Air Quality Maintenance Areas--areas which do not or will not meet one or more of the national ambient air quality standards within the required time period. In these areas, new sources of air pollutants or future development will be discouraged in order to prevent adverse air quality impacts.

The Clean Air Act of 1977 gives the Administrator of EPA the power to condition or withhold a grant for the construction of a treatment plant if he or she determines:

1. the treatment works does not comply with standards set for new sources or hazardous pollutants;

2. the SIP does not provide for the increase in emissions of each air pollutant which could reasonably be anticipated to result directly or indirectly from the new sewage treatment capacity;

3. new treatment capacity may reasonably cause or contribute directly or indirectly to increases in emission above that provided for in the SIP or will be inconsistent with the SIP;

4. increases in emissions would interfere with or be inconsistent with the SIP of another State; or

5. there is no approved SIP.

In making this determination, both primary and secondary impacts are evaluated. Policy guidance on this will soon be developed by EPA.

Minimum Requirement

Gather data on the existing air quality of the planning area. In particular, note if it is within an Air Quality Maintenance Area and if there is an approved State SIP which includes the planning area.

Primary impacts include increased traffic to and from the site during construction and operation of the plant, increased pollution from construction activities and emissions from sludge incineration. Construction activities will cause temporary impacts. Efforts should be made to reduce the severity of these effects. EPA has established new source standards for certain types of equipment which emit pollutants, including sludge incinerators which will create a new source of air pollution. Grantees will be required to obtain a permit from the State if the new treatment works will use incineration as the method of sludge disposal.

Secondary impacts are the result of increased emissions from new homes, industries and automobiles. Consult the SIP to determine if the increased population has been considered and analyzed. If the SIP did not anticipate the new growth predicted as a result of the treatment works or if there is no SIP, the supplemental requirement outlined in the next section should be undertaken.

Supplemental Requirement

It is very difficult to predict secondary air pollution impacts. Various computer and manual models have been or are in the process of being developed to forecast future emissions by pollutants and the effect on air quality. Systems which predict the level of future emissions look at a variety of factors including present and future demographic and land use information. GEMLUP II is an example of such a system. It was developed for the EPA, Office of Transportation and Land Use Policy. This system uses data similar to that needed to complete other sections of the environmental assessment for a series of work sheets. Models exist which can utilize the output of GEMLUP II to predict the impact on air quality. These systems look at factors such as meteorology, topography, population distribution and existing air quality.

Sources

State air pollution control agency

EPA, regional air quality division

References

Guidelines for Air Quality Maintenance Planning and Analysis, Office of Air Quality Planning and Standards, EPA

Procedures for Tracking Emissions Growth in Air Quality Maintenance, Office of Transportation and Land Use Policy, EPA 400/1-77-001

Clean Air Act, 42 USC §§7401-7642

4.2 Water Quality and Quantity

Description

The Federal Water Pollution Control Act Amendments of 1972 and the Clean Water Act of 1977 were enacted to restore and protect the "chemical, physical and biological integrity of the Nation's waters," to attain a level of water quality that is suitable for recreational uses and that is safe for fish and wildlife by 1983. All projects under the Construction Grants Program should be evaluated in terms of their contribution to achieving the water quality objective of the Clean Water Act.

This section focuses on both the quality and quantity of water sources. Water quality is measured by certain parameters that indicate the physical, chemical and biological condition such as turbidity, dissolved oxygen, fecal coliform. Possible primary impacts on water quality include: impacts from construction activities, improvement in quality due to additional treatment and effects of disposing effluent in receiving waters. The effluent of the plant will be covered by a National Pollutant Discharge Elimination System (NPDES) permit and will not be discussed in detail in this handbook.

In analyzing the effects of the project on the quality of water, the grantee should consider the requirements of the Safe Drinking Water Act. Under this Act, Federal funds cannot be committed to any project which could contaminate a sole source aquifer. A sole source aquifer is an aquifer which has been designated as the sole drinking water source for an area, and if it were to become contaminated, a significant hazard to public health would be created.

Minimum Requirement

Locate all surface and ground water in the planning area. Determine the physical nature, flow characteristics, usage and quality of each

body of water. Also, identify aquifers and their recharge areas to the extent possible. Describe aquifers in terms of formation, material thickness and depth.

Applicants must also determine if the construction activities for any alternative will result in erosion or sediment runoff. In analyzing impacts, consider what effect changes in water quality will have on fish and plant life and the availability of water for uses such as recreation. Include a description of all steps to mitigate the impact on surface and ground water that will be taken for each alternative. Possible mitigating measures include (1) planning development to fit drainage patterns, topography and soil conditions of the site; (2) avoiding the removal of trees and surface vegetation; and (3) constructing impoundments and water control structures to reduce erosion and trap sediment. For a complete discussion of mitigating methods, see Direct Environmental Factors at Municipal Wastewater Treatment Works.

Secondary impacts on water quality can be attributed mainly to increased surface runoff, which includes excessive stormwater flow and sediment runoff. A second source of secondary impacts, pollution from new point sources, will be controlled by NPDES permits and is therefore, not discussed in detail here. Excessive stormwater flow results from water which runs across impervious surfaces during intense rains. In addition to causing floods, these waters contain significant amounts of pollutants that will flow or seep into surface and ground water. Constructing new homes, roads and industrial complexes increases the amount of impervious surface area and thereby increases excess stormwater flow. Sediment deposition is a measure of the erosion of soil that occurs throughout a community. It affects the quality and regime of local streams. The degree of development and the rate at which it occurs is influenced by the production of sediment. Sedimentation can slow the flow of a stream and raise the streambed, in turn increasing chances of flooding.

If population is projected to increase substantially during the planning period or if a significant amount of the area is vacant or in low density development and is likely to be developed during the planning period, the supplemental requirement detailed in the next section should be undertaken. If not, steps should be taken to mitigate any expected impact on water quality. For example, the community can adopt erosion and sediment control ordinances.

Grantees must also determine if the planning area contains a designated sole source aquifer. If it does, the more detailed analysis required in the next section will aid in determining the impacts of the project on the aquifer.

The new treatment works can affect water quality by changing supply or demand for water. The supply of useable water is influenced by surface runoff among other factors because changes in runoff patterns

can alter the quantity of water available to recharge existing sources. On the other hand, new developments can create additional demand on water supply. Grantees should examine the present water supply for the area. To determine future demand and supply for the area, consult local officials. If no local information is available, an estimate of demand can be made using average consumption figures not to exceed those shown in Table 3, and estimates of future population. Estimates should take into consideration planned water conservation efforts.

Supplemental Requirement

There are various models that have been developed for estimating stormwater runoff and the effects of new point and nonpoint sources on stream quality. One common method used for stormwater runoff is the rational formula which is discussed in this section. Grantees can use any available method that is appropriate for the planning area.

The rational formula can be used with data on present and future land uses and rainfall to predict the expected change in runoff that will be associated with the project. The formula's reliability decreases for areas greater than 10 acres and is less accurate if input data does not reflect the characteristics of the area being considered. The rational formula is as follows:

$Q = CIA$ where:

Q = peak discharge or flow rate in cubic feet per second

C = runoff coefficient

I = average rainfall intensity in inches per hour

A = drainage basin area in acres

This formula should be used to determine present and future runoff. Runoff coefficients depend upon the soil conditions and land use of the area being considered. They should be based on actual experience in the planning area on amounts of pollutants per acre contributed by various types of developed conditions. If coefficients are not available for the area, those shown in Table 4 can be used.

Grantees should consider using the information on runoff developed by the rational formula or some other model to predict the effects of the project on the quality of particular bodies of water in the planning area.

Sources

Department of Interior, U.S. Geological Survey

TABLE 3

WATER CONSUMPTION RATES IN THE RESIDENTIAL SECTOR

*	Non-SMSA cities and towns with projected total 10-year populations of 5,000 or less	60-70 gallons/ capita/day (gpcd)
*	Other cities and towns	65-80 gpcd

TABLE 4

VALUES OF RUNOFF COEFFICIENTS (C) FOR URBAN LAND USE

Type of Drainage Area	Runoff Coefficients - C
Lawns:	
Sandy soil, flat, 2%	0.05-0.10
Sandy soil, average, 2-7%	0.10-0.15
Sandy soil, steep, 7%	0.15-0.20
Heavy soil, flat, 2%	0.18-0.17
Heavy soil, average, 2-7%	0.18-0.22
Heavy soil, steep, 7%	0.25-0.35
Business:	
Downtown areas	0.70-0.95
Neighborhood areas	0.50-0.70
Residential:	
Single-family areas	0.30-0.50
Multi units, detached	0.40-0.60
Multi units, attached	0.60-0.75
Suburban	0.25-0.40
Apartment dwelling areas	0.50-0.70
Industrial:	
Light areas	0.50-0.80
Heavy areas	0.60-0.90
Park, cemeteries	0.10-0.25
Playgrounds	0.20-0.35
Railroad yard areas	0.20-0.40
Unimproved areas	0.10-0.30
Streets:	
Asphalt	0.70-0.95
Concrete	0.80-0.95
Brick	0.70-0.85
Drives and walks	0.75-0.85
Roofs	0.75-0.95

State water control agency

EPA regional water division

Local water committees

Designated areawide waste management 208 agency

References

Direct Environmental Factors at Municipal Wastewater Treatment Works, EPA 430/9-78-03 (January, 1976)

PRM 78-1, Erosion and Sedimentation Control in the Construction Grants Program

Guidelines for Erosion and Sediment Control Planning and Implementation, EPA-R2-72-015 (August, 1972)

Development and Application of a Simplified Stormwater Management Model, EPA 600/2-76-218 (August, 1976)

The Safe Drinking Water Act of 1974, 42 USCA §§300f-300j9 (1974)

Water Programs, Sole or Primary Source Aquifer Areas, 42 FEDERAL REGISTER 51,620 (1977) (to be codified as 40 CFR Part 148)

Water Pollution and Quality Data Information, Storage and Retrieval System (STORET) (EPA)

4.3 Noise

Description

Usually, noise pollution impacts are temporary and principally associated with the actual construction and operation of the facility. Noise pollution has various psychological, sociological and physiological effects on people including loss of hearing, interference with communications, disruption of activities, loss of sleep, annoyance, mental stress and anxiety.

Minimum Requirement

All efforts should be made to minimize noise levels. The EPA publication, Direct Environmental Factors at Municipal Wastewater Treatment Works, outlines possible steps that can be used to reduce noise levels.

If the facility is to be located in close proximity to schools, libraries or other noise sensitive areas or in rural communities, the more detailed evaluation of effects should be undertaken.

Supplemental Requirement

Data on existing noise levels should be collected. Various Federal agencies such as the Federal Highway Administration study the noise impacts of their projects. Determine if such a study has been done for the planning area. If not, new measurements should be taken. Estimate the impact the new facility will have on noise levels. Consider mitigation measures such as relocating the plant or creating a vegetative buffer zone.

Sources

Agencies that do noise studies:

Department of Transportation, Federal Highway Administration

Department of Transportation, Federal Aviation Administration

Department of Housing and Urban Development

References

Direct Environmental Factors at Municipal Wastewater Treatment Works, EPA-430/9-76-003, MCD-20 (January, 1976)

Noise Control Act of 1972, 42 USC §§4901-4918 (1973), 49 USC §§1431 (1976)

Public Health and Welfare Criteria for Noise, EPA 550/9-75-002 (July, 1973)

Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, EPA 550/9-74-004 (March, 1974)

4.4 Odor

Description

Odor pollution causes unique problems in that it is hard to predict what concentrations and intensities will be offensive to individuals. There have, however, been sufficient complaints received about wastewater treatment plants to warrant some evaluation of these impacts.

Minimum Requirement

Grantees should be concerned with the odors associated with the operation of the treatment facility. Efforts should be made to ensure that steps have been taken to mitigate these impacts. For example, the plant should be located as far as possible from residential areas. In addition, methods to reduce or control odors as discussed in Direct Environmental Factors at Municipal Wastewater Treatment Works should be considered whenever the facility must be located in close proximity to sensitive areas.

References

Direct Environmental Factors at Municipal Wastewater Treatment Works, EPA-430/9-76-003, MCD-20 (January, 1976)

4.5 Solid Waste

Description

Recent Federal laws establish a comprehensive national program to control the production and disposal of solid waste and to encourage resource conservation and recovery practices. Sludge is a solid waste that is subject to these acts. Other forms of solid waste generated by residents should also be considered in the environmental assessment.

Minimum Requirement

Evaluate the current system for dealing with solid wastes. In particular, determine the method and amount of land used as disposal sites.

For primary impacts consider the method for waste disposal selected for the treatment plant. Estimate the amount of sludge the treatment process will produce and evaluate the impacts. For land fill or application, estimate the acreage required and the availability of land to meet the future need. For incineration make sure that air pollution impacts have been considered.

If the population increase will be substantial or if a significant amount of undeveloped land is likely to be developed during the planning period, supplemental analysis should be undertaken.

Supplemental Requirement

Using the estimates developed for population, housing and industrial growth, develop the future solid waste load. If adequate figures are available for your area, use them. If not, use the average figures shown on the accompanying tables. (Tables 5 and 6.) Also, take into account any conservation measures proposed for the area. Once an estimate is developed, the grantee should evaluate the area's capacity to handle the increased load.

Reference

Solid Waste Disposal Act, 42 USCA §§3251 et. seq. (1973)

Resource Conservation and Recovery Act of 1976, P.L. 94-580 (October, 1976) 42 USC §§6901-6987

TABLE 5

MUNICIPAL SOLID WASTES COLLECTION RATES

pounds/capita/day

Population	Waste Collection by Population Density Ranges		
x	0-3,999/sq.mi.	4,000-6,999/sq.mi.	7,000-+/sq.mi.
0 - 4,999	3.3	-	-
5,000-19,999	3.5	5.0	4.6
20,000-99,999	4.1	4.1	4.6
100,000	4.6	5.1	5.6

SOLID WASTE GENERATION BY DWELLING TYPE

	Single family	Multifamily	Apt. House
Pounds/capita/week	12.54	9.83	6.91
Gallons/capita/week	14.07	11.00	5.61
Pounds/cubic yard	179.97	180.50	243.37

SOURCE: Land Use, Urban Form and Environmental Quality

TABLE 6

ESTIMATES OF MANUFACTURING WASTES

Industry	Multipliers tons/employee/year
Food Processing	
Seasonal foods	5.56570
Other foods	4.81655
Paper, Printing and Publishing	12.87060
Chemicals	8.21075
Textiles and Apparel	.52575
Rubber and Plastics	1.54810
Leather	2.49365
Stone, Clay, Glass and Concrete	18.11425
Primary and Fabricated Metals	6.73000
Electrical and Nonelectrical Machinery	3.58040
Lumber and Wood Products	21.68805
Furniture and Fixtures	20.15545
Transportation Equipment	3.39330
Instruments	3.51700

Application of Sewage Sludge to Cropland: Appraisal of Potential Hazards of the Heavy Metals to Plants and Animals, EPA 430/9-76-013, MCD-33 (November, 1976)

Municipal Sludge Management: Environmental Factors, EPA 430/9-77-004, MCD-28 (October, 1977)

Municipal Sludge Management: EPA Construction Grants Program, An Overview of the Sludge Management Situation, EPA 430/9-76-009, MCD-30 (April, 1976)

EPA Policy on Land Treatment of Wastewater, October 1977

PRM 79-3, Revision of Agency Guidance for Evaluation of Land Treatment Alternatives Employing Surface Application

4.6 Energy

Description

Because of the recently increased concern about the limited resources available to meet our energy needs, the environmental assessment should include an analysis of energy impacts. Impacts include the energy requirements needed to operate the treatment plant, to manufacture chemicals used in wastewater treatment, and to meet the demand of future population and industrial growth complexes.

Minimum Requirement

Under the Clean Water Act of 1977, the Administrator of EPA is required to encourage waste treatment management methods, processes and techniques which will reduce total energy requirements. Regulations issued as a result of the Act require facility plans begun after October 1, 1978, to include an analysis of primary energy requirements for each alternative studied. The selected plan must include cost-effective measures to reduce energy consumption or increase energy recovery (40 CFR §35.917-1(d)(9)). EPA has issued a publication entitled Energy Conservation in Municipal Wastewater Treatment which should be of assistance in measuring energy demands and suggesting conservation methods.

Waste treatment alternatives which will substantially conserve energy are considered to be "innovative" and accorded special treatment under the Clean Water Act of 1977. A 15 percent preference is given to innovative alternatives in the cost-effectiveness analysis. If the plan selected is innovative, it may receive a grant for 85 percent of eligible costs.

If substantial population increases within the project area are anticipated in the planning period or if new sewers are to be sited on

substantial amounts of low density land, a more detailed analysis of secondary impacts should be undertaken.

Supplemental Requirement

Estimate present energy consumption by type of facility--single family home, commercial, industrial, etc. Using this data and estimates of future housing and industrial development, determine the appropriate future demand. It may be necessary to break demand down into the types of energy required (i.e., coal, oil). Compare this estimate with the projected future energy resources for the area. Note in particular any shortages that may affect or limit future development.

Sources

County government or multi-county planning bodies

Private trade association involved with oil or gas industry

State department of business, industrial or economic development

Energy user trade association

References

Energy Conservation in Municipal Wastewater Treatment, EPA 430/9-77-011 (March, 1977)

Cost-Effectiveness Analysis Guidelines, 40 CFR Part 35, Subpart E, Appendix A

Guidelines for Alternative and Innovative Technology, 40 CFR Part 5, Subpart E, Appendix E

Appendix A: EPA Implementation of the National Environmental Policy Act of 1969

Section 102(2)(c) of NEPA (40 USC §4332(2)(c)) requires a Federal agency to prepare an EIS for every major Federal action significantly affecting the quality of the human environment.

EPA has issued regulations to implement NEPA in 40 CFR Part 6. These regulations were originally promulgated on January 17, 1973 (38 FEDERAL REGISTER 1696 (January 17, 1973)) and were revised on April 14, 1975 (40 FEDERAL REGISTER 16815 (April 14, 1975)). These regulations provide general requirements at Subpart A with additional requirements for section 201 wastewater treatment works construction grants contained in Subpart E and 40 CFR §35.900 et seq.

Under the current EPA regulations implementing NEPA, an applicant for a construction grant is required to submit an environmental assessment with the facilities plan developed under a Step 1 grant. However, an environmental assessment is required as an integral part of facilities planning only for such planning which was initiated after April 30, 1974. For facilities planning which was determined to have been initiated prior to May 1, 1974, only the requirements in 40 CFR §§35.925-7 and 35.925-8 were applicable. Section 35.925-8 provides:

> "That the NEPA requirements (Part 6 of this chapter), applicable to the project step, have been met. Such compliance is a basic prerequisite for Step 2, Step 3, and combination Step 2 and 3 projects. An adequate assessment of expected environmental impacts, consistent with the requirements of the National Environmental Policy Act of 1969 (42 USC 4321 et seq.), is required as an integral part of facilities planning initiated after April 30, 1974, in accordance with §35.917-1." (Emphasis added.)

An environmental assessment is to include a description of the environmental impacts of the proposed action, description of steps to minimize any adverse environmental effects, evaluation of alternatives, description of the existing and future environment without the proposed project, and documentation. The purpose of the environmental assessment is to ensure that the Step 1 grantee considers the environmental impacts of a proposed action at the earliest possible point in the Step 1 grantee's planning process.

During the development of the facilities plan, the Step 1 grantee is required to hold at least one public hearing before a facilities plan is adopted. However, this requirement is made applicable only to facilities planning initiated after April 30, 1974. New public participation activities during facilities planning will be required by a new 40 CFR Part 25 and by revisions to 40 CFR Part 35 to be promulgated early in 1979.

EPA will make a determination as to the applicability of NEPA requirements before either approval of the facilities plan or award of Step 2 and Step 3 grants if an approved facilities plan is not required. EPA will study the proposed action, including a review of any environmental assessment received, to identify and evaluate the environmental impacts of the proposed action and feasible alternatives. From this review, EPA will determine whether significant impacts are anticipated from the proposed action, whether any feasible alternatives can be adopted or change can be made in project design to eliminate significant adverse impacts, and whether an EIS or a negative declaration is required.

In determining whether an EIS or a negative declaration is required for a proposed wastewater treatment works construction grant project, EPA employs the criteria detailed in 40 CFR §§6.200, 6.510. The criteria listed in 40 CFR §6.510 are applicable only to Step 2 and Step 3 grants awarded after June 30, 1975. If EPA determines based upon these criteria that the proposed project will have a significant impact upon the environment, EPA will prepare an EIS pursuant to Subpart C of 40 CFR Part 6.

If EPA determines, based upon these criteria, that the proposed project will not have a significant impact upon the environment, EPA will issue a negative declaration together with an environmental impact appraisal. The negative declaration is a written announcement prepared after EPA's environmental review stating that EPA has determined that an EIS is not required for a proposed project, and it summarizes the supporting environmental impact appraisal. The environmental impact appraisal is prepared concurrently with the negative declaration and briefly describes the proposed action and feasible alternatives, environmental impacts of the proposed action, unavoidable adverse impacts of the proposed action, the relationship between short term uses of man's environment and the maintenance and enhancement of long term productivity, steps to minimize harm to the environment, irreversible and irretrievable commitments of resources to implement the action, comments and consultations on the project, and reasons for concluding that the proposed action will not have a significant environmental impact.

The public is given fifteen working days to comment on the negative declaration and appraisal. No administrative action on the project is taken by EPA during this public comment period. If no significant environmental issues are raised during this public comment period, then a grant award can be made. If significant environmental issues are raised during the review period, the decision on the administrative action may be changed or delayed until a new environmental appraisal or an EIS is prepared.

Once a negative declaration and environmental impact appraisal have been prepared for the facilities plan for a certain area, Step 2 and Step 3 grant awards may be made to implement the facilities plan without preparation of any additional negative declarations, unless the project has changed significantly from that described in the facilities plan.

Appendix B: GLOSSARY

Advisory Council on Historic Preservation - an independent executive agency empowered to comment upon all undertakings licensed, assisted or carried out by the Federal government that have an effect upon properties in the National Register.

Aquifer - an underground layer of permeable material that will yield sufficient water to be considered as a source of water supplies.

Comprehensive Land Use Plan - a long range comprehensive plan looking to the future growth and development of the area involved and seeking to project into time a concept under which the community may be developed in an orderly and desirable fashion and through which the needs of its population will be better served. (Beuscher, Wright, Gittleman, Land Use, 1969, p. 240)

Critical Habitat - any land, air or water area including any elements thereof which the Secretary of Interior under the provisions of the Endangered Species Act has determined is essential to the survival of wild populations of a species listed as endangered or threatened or to its recovery to a point at which it need no longer be protected.

Endangered Species - any species which the Secretary of Interior has designated as being in danger of extinction throughout all or a significant portion of its range other than a species of the class insecta determined by the Secretary of Interior to constitute a pest whose protection would present overwhelming and overriding risk to man.

Environmental Appraisal - document based on an environmental review that supports a negative declaration. It describes a proposed EPA action, its expected environmental impact, and the basis for the conclusion that no significant impact is anticipated.

Environmental Assessment - a written analysis submitted to EPA by grantees describing the environmental impacts of proposed actions under the Construction Grants Program or other programs. It is an integral, though identifiable, part of the facility plan.

Environmental Impact Statement (EIS) - a report prepared by EPA, which identifies and analyzes in detail the environmental impacts of a proposed EPA action and feasible alternatives. Under the National Environmental Policy Act (NEPA), the report is required for all major Federal projects that will have a significant effect on the quality of the human environment.

Facility Plan - preliminary plan prepared by the grantee as the basis for construction of publicly owned treatment works. Specific requirements for these plans appear in 40 CFR §35.917 (1977).

Flood - general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland and/or tidal waters and/or the unusual and rapid accumulation or runoff of surface water.

Floodplain - relatively flat areas or lowlands adjoining the channel of a river, stream or water course which has been or may be covered by flood water. The base floodplain (100 year floodplain) is the area with one percent chance of flooding in any year.

Grantee - as used in this handbook - municipality which has been awarded a grant for the preparation of a facility plan for the construction of a treatment works.

Impact - any change, beneficial or detrimental, that is caused, directly or indirectly, by the construction of a wastewater treatment facility.

Primary impact - impact directly associated with the construction and operation of the treatment plant.

Secondary impact - (1) indirect or induced change in population and economic growth and land use, and (2) other environmental effects resulting from these changes in land use, population and economic growth.

National Register of Historic Places - a register of districts, sites, buildings, structures and objects significant in American history, architecture, archeology and culture maintained by the Secretary of Interior. The National Register is published in its entirety in the FEDERAL REGISTER each year in February. Addenda are published on the first Tuesday of each month.

National Environmental Policy Act of 1969 (NEPA) - Federal law enacted to ensure that all Federal agencies include in the decision-making process appropriate and careful consideration of all environmental effects of proposed actions, explain potential environmental effects of proposed actions and their alternatives for public understanding, avoid or minimize adverse effects of proposed actions, and restore or enhance environmental quality as much as possible.

Prime Farmland - land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oil seed crops, and is also available for these uses. It has soil quality, growing season and moisture supply needed to economically produce sustained high yields of crops when treated and managed.

Recharge Areas - an area in which water is absorbed and eventually reaches one or more aquifers.

Threatened Species - any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Unique Farmland - land other than prime farmland that is used for the production of specific high value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods.

Wetland - area that is inundated by surface or ground water with a frequency sufficient to support vegetative or aquatic life that requires saturated soil conditions.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF WATER AND
HAZARDOUS MATERIALS

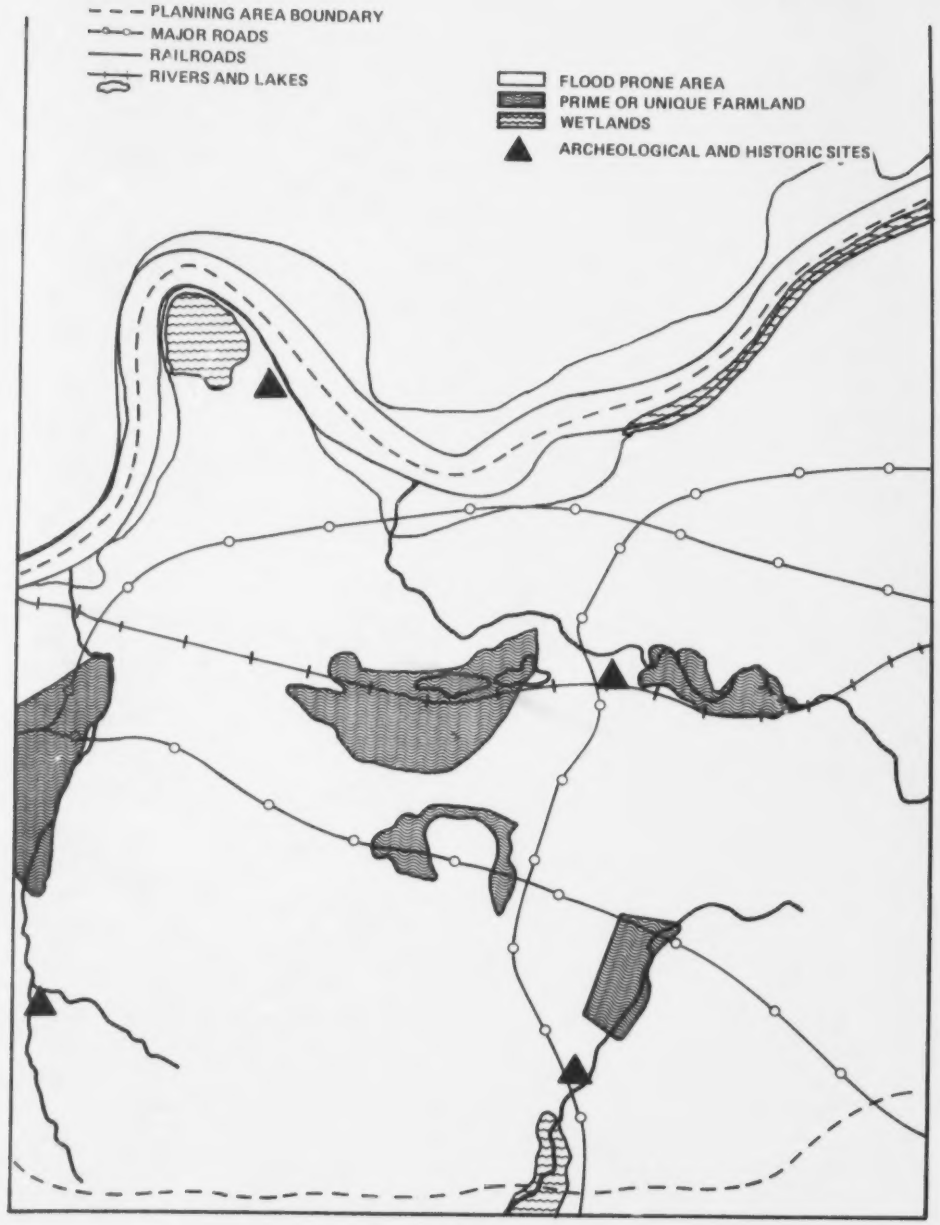
NOTE

TO THE READERS OF FRD-5, "ENVIRONMENTAL ASSESSMENT OF CONSTRUCTION GRANTS PROJECTS"

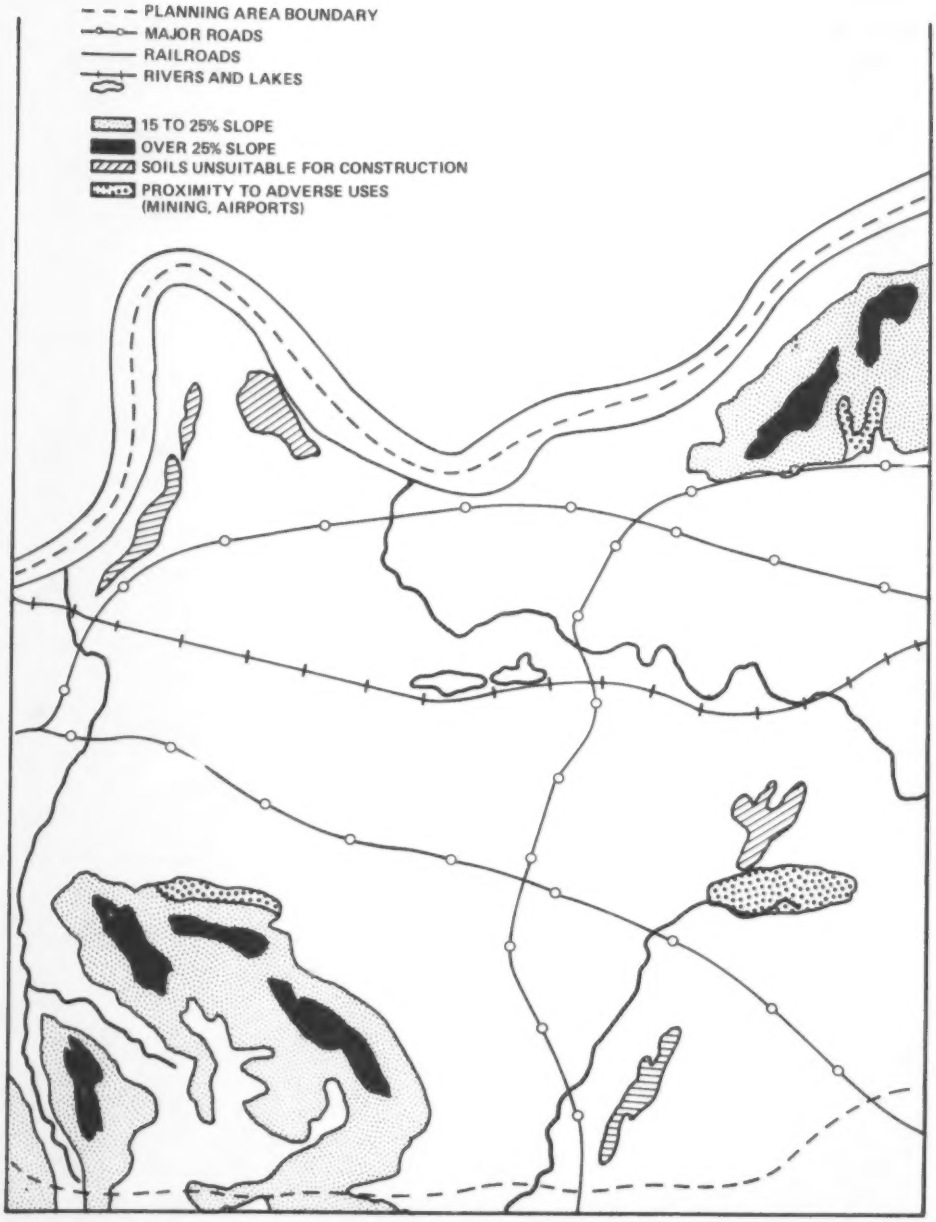
Due to a contractor's error, all of the maps contained in the envelope on the back of this publication were printed with the identification "BASE MAP." The last map in the package is to be considered the base map. The indication of the "BASE MAP" is to be ignored on the remaining maps. The remaining maps are to be positioned on the base map as explained on page 7 of this publication. We regret any inconvenience that may result from this error.

BASE MAP

AREAS WITH LEGAL OR INSTITUTIONAL PROTECTION

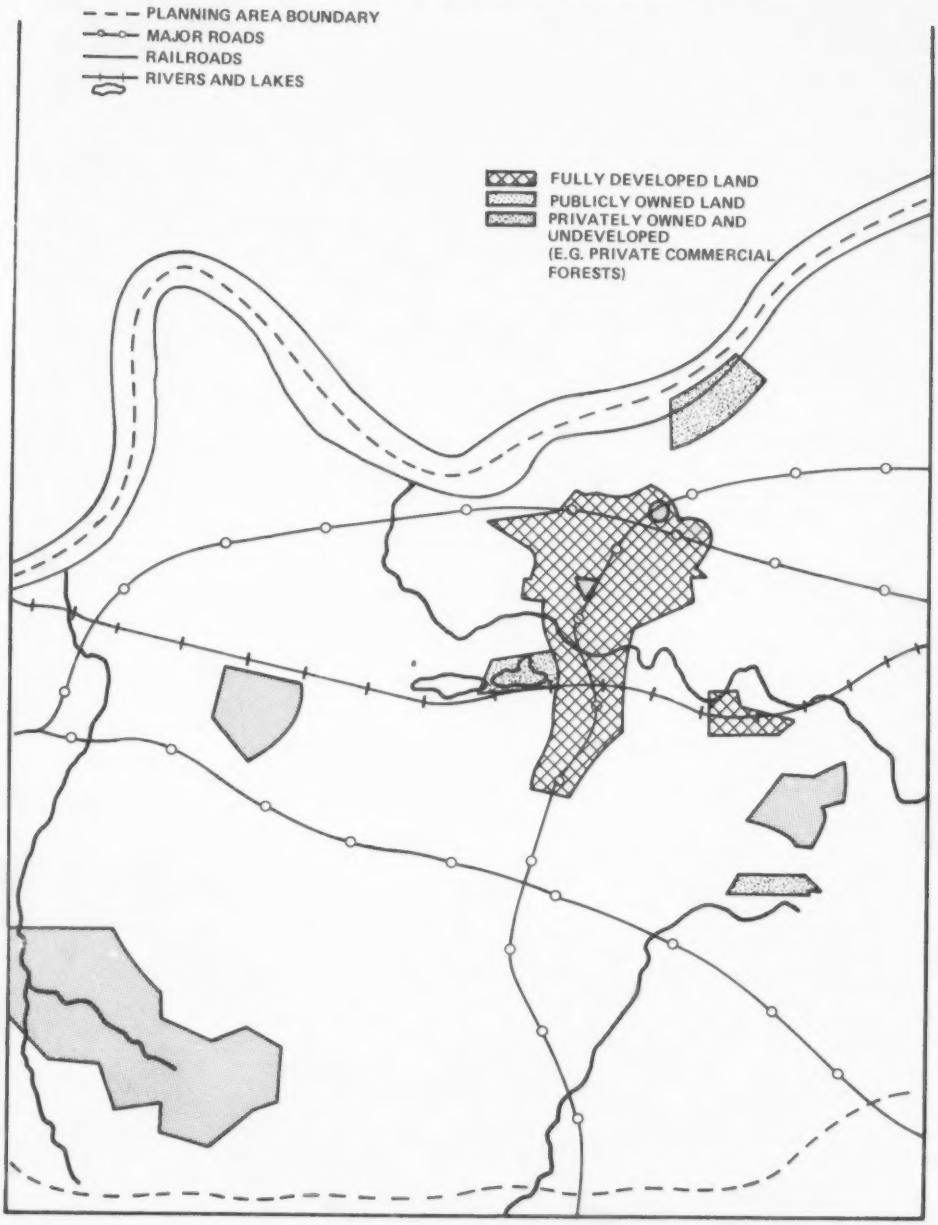


BASE MAP
AREAS WHOSE CHARACTERISTICS INHIBIT DEVELOPMENT



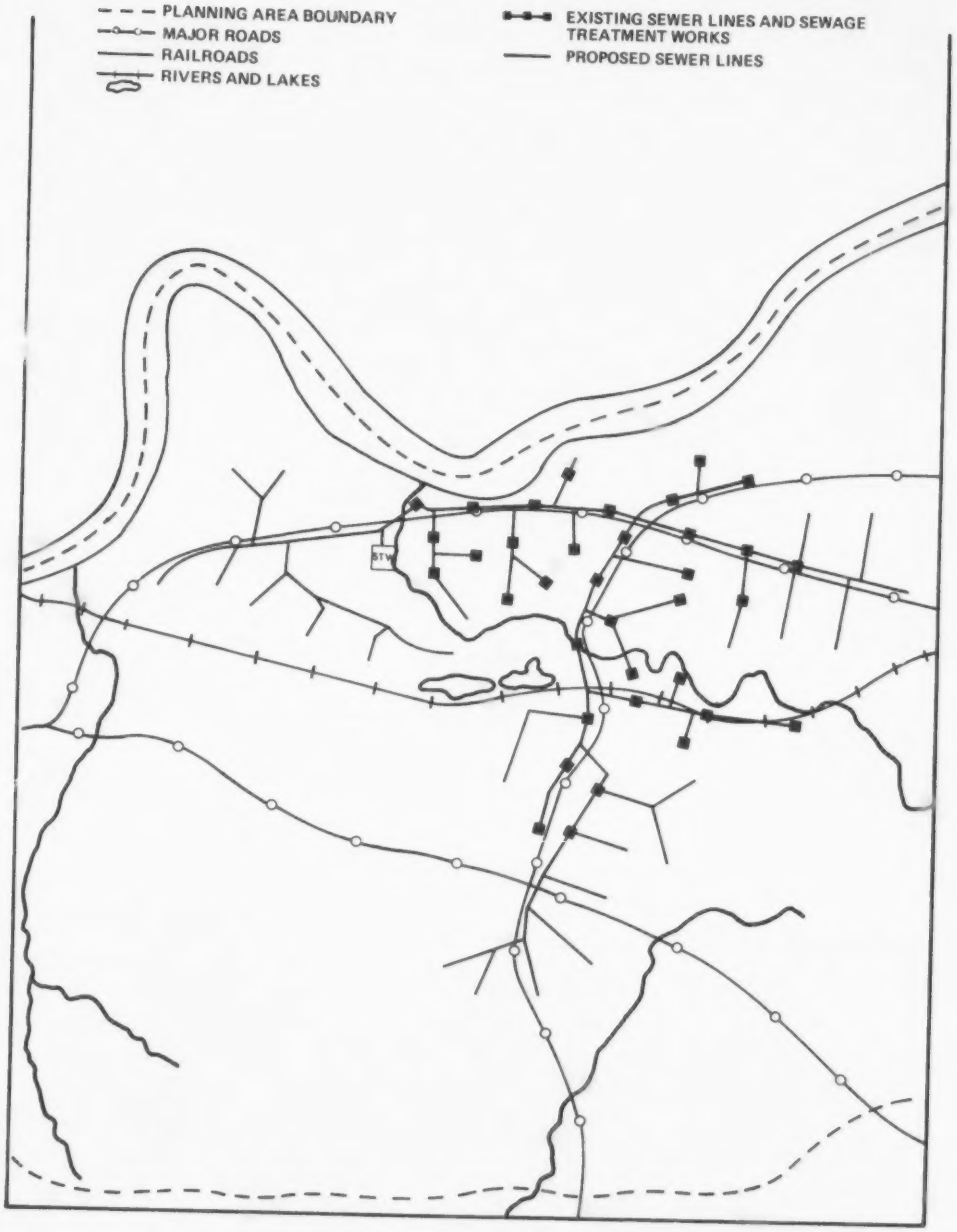
BASE MAP

AREAS NOT SUBJECT TO FURTHER DEVELOPMENT

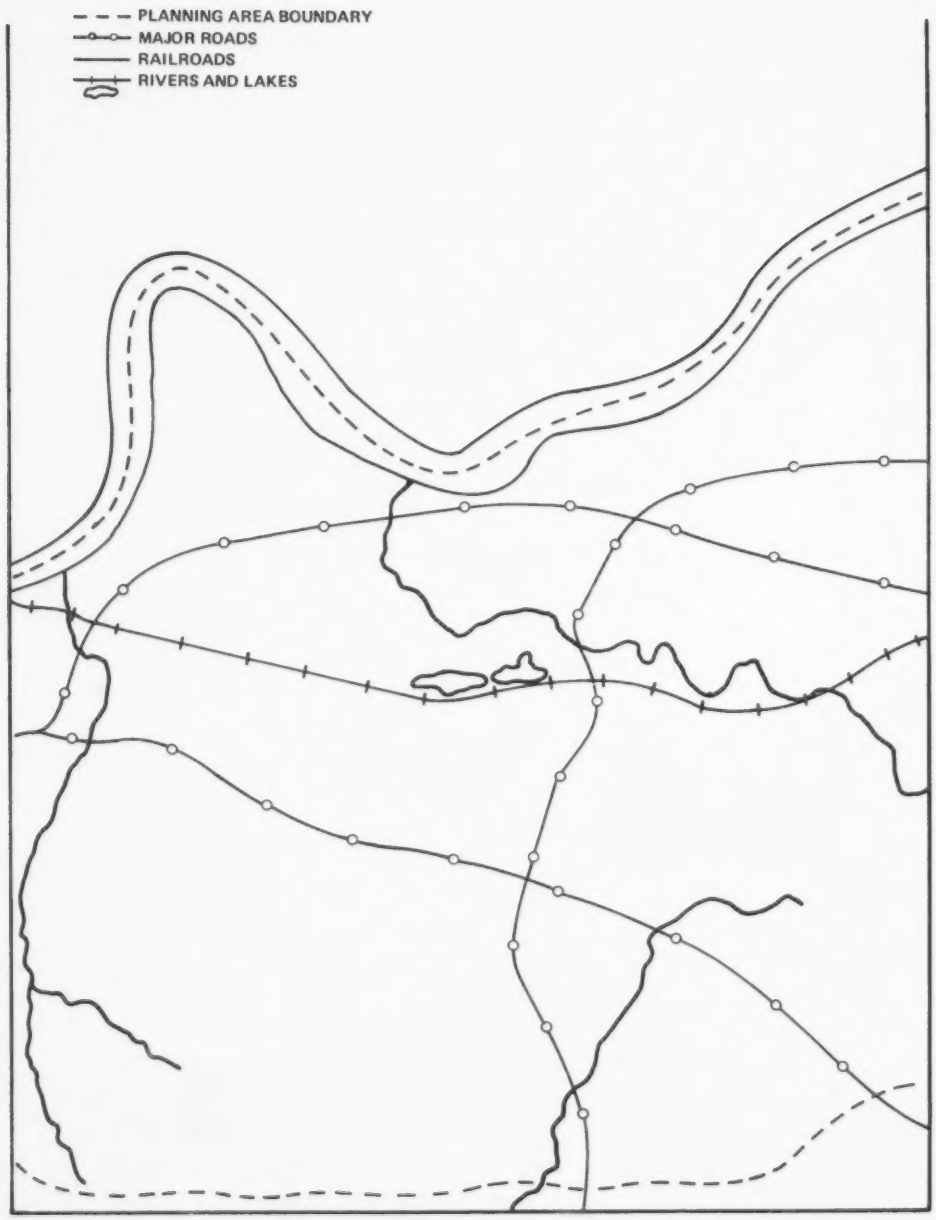


BASE MAP

EXISTING AND PROPOSED WASTEWATER TREATMENT WORKS



BASE MAP


PLANNING AREA BOUNDARY
MAJOR ROADS
RAILROADS
RIVERS AND LAKES